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REPORT

OF THE

MINISTER OF THE INTERIOR

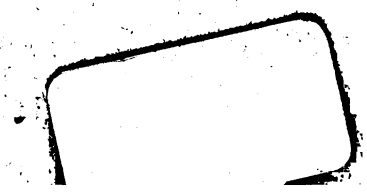
TO THE

PRESIDENT OF THE REPUBLIC OF HAWAII

FOR THE

BIENNIAL PERIOD ENDING DECEMBER 31, 1897.

HONOLULU:
PRINTED BY THE HAWAIIAN GAZETTE CO.,
1898.



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REPORT

OF THE

MINISTER OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
Honolulu, Dec. 31, 1897.

MR. PRESIDENT:

In accordance with the requirements of Section 1, Article 35 of the Constitution, I have the honor to submit a Report of the principal transactions of the Department of the Interior for the year ending December 31st, 1897.

As the Report for the year 1896 was not issued in printed form, it has been deemed advisable to include portions of the same herewith, thus showing the total expenditures from the appropriations, the improvements in Public Works accomplished during the Biennial Period for which such appropriations were made, as well as for comparative showings of the Revenue of the Department and the sources from which derived.

ıe Legislative Appropriations for this Department he two years to end December 31, 1897, together with amounts drawn and the balances, are summarized ollows:

SOURCE.	Total Appropriations.	Total Disbursed.	Balances Dec. 31, 1897.
ım Current Receipts	$1,298,216 26	$1,164,897 22	$ 133,319 04
ım Loan Fund.....	855,000 00	689,860 73	165,139 27
	$2,153,216 26	$1,854,757 95	$ 298,458 31

ROAD TAX—SPECIAL DEPOSIT.

he Road Tax (Special deposit) balance Dec. 31, 1895, amounted to		$ 43,396.43
redit Receipts 1896.....	$70,783.00	
redit Receipts 1897.....	82,066.00	
		152,849.00
Total		$196,245.43
Drawn 1896	$67,656.81	
Drawn 1897	88,278.71	
		155,935.52
Credit Balance Dec. 31, 1897..		$ 40,309.91

STATEMENT SHOWING THE AMOUNT EXPENDED IN THE SEVERAL DISTRICTS FOR ROAD PURPOSES, FOR THE TWO YEARS ENDING DECEMBER 31ST, 1887.

DISTRICT	ROAD TAX FUND	APPROPRIATIONS		TOTALS
		Roads and Bridges. Current	Roads and Bridges. Loan	
North Hilo	$ 4,045 08	$ 2,500 00	$ 39,800 00	$ 46,345 08
Hilo	22,131 01	15,000 00	63,000 00	100,131 01
Volcano Road } Puna }	4,223 00	17,547 04	32,275 67	54,045 71
Kau	6,123 91	.....	3,976 79	10,100 70
South Kona	2,510 98	1,270 75	40,000 00	43,781 73
North Kona	4,697 09	21 83	49,874 00	54,592 92
South Kohala	641 96	488 00	11,140 29	12,270 25
North Kohala	4,994 78	570 00	.....	5,564 78
Hamakua	12,095 80	950 00	7,000 00	20,045 80
Lahaina	2,323 69	547 30	9,865 28	12.736 27
Wailuku	14,665 33	504 50	11,118 90	26,288 73
Makawao	7,041 00	993 26	6,000 00	14,034 26
Hana	8,034 85	.....	.....	8,034 85
Molokai	936 00	1 25	.....	937 25
Lanai	254 90	.....	.....	254 90
Honolulu	.....	30,556 69	174,824 59	205,381 28
Ewa & Waianae	10,948 80	4,804 77	2,600 00	18,353 57
Waialua	3,624 25	2,967 97	.....	6,592 22
Koolauloa	4,113 00	.....	.....	4,113 00
Koolaupoko	7,019 00	.....	.....	7,019 00
Lihue	7,917 52	.....	.....	7,917 52
Koloa	5,335 16	600 00	8,000 00	13.935 16
Waimea	11,232 01	.....	.....	11,232 01
Hanalei	5,836 40	954 00	.....	6,790 40
Kawaihau	4,800 00	.....	.....	4,800 00
Niihau	390 00	.....	.....	390 00

Interior Department Receipts For The Year 1897, as Compared With The Year 1896.

Receipts at Clerks Office.	1896.	1897.	Increase.	Decrease.
License Fees:				
Agents, Commercial	500 00	.....	.....	500 00
Agents Labor Contract	100 00	100 00	.....	.....
Agents to take Acknowlegements	85 00	80 00	.....	5 00
Alcohol	200 00	100 00	.....	100 00
Auction	1,718 71	1,085 89	.....	632 82
Awa	5,960 25	2,427 00	.....	3,533 25
Banking	1,750 00	3,000 00	1,250 00	.....
Billiard	525 00	450 00	.....	75 00
Boat	48 00	120 00	72 00	... .
Boatman	23 00	30 00	7 00	.....
Butcher, Beef	1,760 00	1,580 00	.....	180 00
" Pork	1,480 00	1,540 00	60 00	.....
Cake Peddling	1,075 00	850 00	.....	225 00
Dray and Wagon	250 00	285 00	35 00	.....
Driver	368 00	392 00	24 00	.....
Drug, Poisonous	200 00	150 00	.....	50 00
Fire-arms, Hunting	180 00	100 00	.....	80 00
Fire-arms, to posses	96 00	220 00	124 00	.....
Hack	1,084 00	1,367 00	283 00	...
Hotel and Restaurant	11,000 00	11,600 00	600 00	.....
Kerosene for fuel	10 00	.....	.....	10 00
Live Stock	.....	.....	.....	.....
Livery Stable	225 00	150 00	.....	75 00
Lodging House	278 00	276 00	.....	2 00
Merchandise	56,488 18	66,558 50	10,070 32	.....
Milk	1,350 00	1,125 00	.....	225 00
Notary Public	570 00	600 00	30 00	.....

Receipts at Clerks Office.	1896,	1897.	Increase.	Decrease.
Physician	120 00	130 00	10 00	.....
Public Show	4,332 50	4,582 75	250 25	.....
Salmon	400 00	520 00	120 00	.....
Spirit { Wholesale	5,500 00	5,000 00	.....	500 00
Spirit { Dealer	3,500 00	4,000 00	500 00	.....
Spirit { Retail	18,000 00	20,000 00	2,000 00	.....
Stock and Share	100 00	200 00	100 00	.....
Tobacco, Cigars & Cigarette	1,310 00	5,800 00	4,490 00	.....
	$ 120,586 64	$ 134,419 14	$ 20,025 57	$ 6,193 07
Rents	33,220 40	48,197 12	14,976 72	.....
Sundry Government Realizations	5,631 97	5,140 90	.....	491 07
Laws, Sales of	85 50	357 00	271 50	.....
Land Office Fees	840 00	665 00	.....	175 00
Land Sales	8,003 50	53,558 20	45,554 70	.....
" " Interest	16 35	.. ...	.....	16 35
	$ 168,384 36	$ 242,337 36	$ 80,828 49	$ 6,875 49
Receipts, Various Bureaus:				
Water Works—				
Honolulu	60,222 45	61,969 30	1,746 85	.....
Hilo	2,352 85	2,649 10	296 25	.....
Laupahoehoe	.....	90 50	90 50	.....
Koloa	.....	130 00	130 00	.....
Market, Honolulu	7,994 10	9,025 00	1,030 90	.....
" Lahaina	62 90	.....	.....	62 90
Registry of Conveyances	11,477 50	13,388 00	1,910 50	.....
Electric Light	1,432 20	924 45	.....	507 75
	$ 251,926 36	$ 330,513 71	$ 86,033 49	$ 7,446 14

From the above statement it will be seen that the increase in Receipts at the Clerk's Office for the year 1897, amounted to..... $73,953.00
And the increase in the Receipts of the several Bureaus for the same period, amounted to. 4,634.35

Making a total increase for the year, of.. $78,587.35

The following is a Comparative Annual Statement of the Receipts under this Department for four years:

1894	$253,727.20
1895	267,168.02
1896	251,926.36
1897	330,513.71

The falling off in the Receipts for 1896 is fully accounted for in the Land Office Statements for that year as compared with those of 1895. Showing—

A decrease in receipts from Rents	$26,953.04
A decrease in Land transactions	22,554.11
	$49,507.15

The decrease in these items was caused by the transfer, to the custody of the Commissioners of Public Lands, of a large proportion of the Government lands previously under the control of this Department.

The Annual Rent Roll so transferred November 1st, 1895, represented $44,148.00.

The Receipts from Land Sales in 1897 amount to $53,558.20. The principal item was the sale of the Ha-

waiian Hotel premises which was offered at Public Auction Oct. 1st, at an upset price of $40,000 and sold for $46.000.

The increase in receipts from License fees may be partly accounted for, in the seven additional classes of Licenses imposed by Act of the Legislature of 1896, and the increased rates or extended localities upon six others already in the Schedule.

The Annual Revenue from this source for the last four years is as follows:

In 1894	$102,732.54
" 1895	106,707.89
" 1896	120,586.64
" 1897	134,419.14

THE FOLLOWING IS THE REVISED SCHEDULE OF FEES FOR LICENSES ISSUED BY THIS DEPARTMENT.

Agent.....	Commercial travelling, Oahu	$ 500
	Commercial travelling each other Island	250
	Labor Contract, Honolulu	50
	Labor Contract, other Districts, no fee.	
	To take Acknowledgements, Honolulu	10

Lodging House		2
Merchandise	When gross Annual Sales are less than $20,000 ...	50
	When $20,000 or over, $\frac{3}{8}$ per cent. on the gross amount.	
Milk	Honolulu	25
	Town of Hilo (radius 2 miles)....	15
	Each other District	5
Notary Public	Honolulu	10
	Each other District	5
Physician .		10
Public Show	Each performance.	5
Salmon .		10
Spirit	Wholesale	500
	Dealers	500
	Retail	1,000
Stock and Share Broker		100
Tobacco, Cigars and Cigarettes		10

In addition to the Fees as above stated, the rates of Stamp tax are as follows:

On licenses of a $20.00 fee or under	$ .50
On licenses over $20.00 to $50.00	1.00
On licenses over $50.00 to $100.00	2.00
On licenses over $100.00 for every additional $50.00 or fractional part thereof	1.00

NATIONALITY OF LICENSE HOLDERS COMPARATIVE STATEMENT FOR TWO YEARS.

LICENSE.	CHINESE		JAPANESE		PORTUGUESE		ALL OTHERS	
	1896	1897	1896	1897	1896	1897	1896	1897
Agent—Commercial Traveller							1	
" Labor Contract							2	2
" to take Acknowlegdments							16	16
Alcohol							4	2
Auction							8	7
Awa	8	5					11	3
Banking			1	1			2	3
Billiard		1		2	1	1	13	10
Bowling Alley								
Boat	1	2			1	3	6	23
Boatman	1	1	1				21	29
Butcher—Beef	13	29		2	8	5	63	39
" Pork	60	66	2	3	2		10	5
Cake Peddling	30	23	12	11				
Dray and Wagon	17	25	7	9	9	13	67	67
Driver	85	82	24	54	46	60	213	196
Drug—Poisonous							4	3
Fire Arm, Hunting	1				2	1	33	19
Hack	61	70	19	44	18	27	89	97
Hote and Restaurant	163	172	31	37	6	1	20	22
Kerosene, for fuel							1	
Live Stock								
Livery Stable						2	5	3
Lodging House	82	82	9	12		1	48	43
Merchandise	452	507	110	120	47	47	205	222
Milk	3	2	38	25	54	48	37	36
Notary Public					2	2	82	86
Physician	3						9	13
Public Show	113	166	9	17	2	1	80	73
Salmon	11	11	1		2	2	26	38
Spirit—Wholesale	3	3	1	1	1	1	6	5
" Dealers			1	1	1	1	5	6
" Retail	2	2			1	1	15	16
Stock and Share							1	2
Tobacco, Cigar and Cigarette	92	374	13	70	6	32	20	104
Total	1085	1623	270	392	207	248	1034	1104

In the total footings as shown above, Physician and Public Show Licenses are not included.

The License to a Physician is not limited and the License for Theatre or other Public Show is at a fixed fee for each exhibition, and frequently the same party or manager, is granted licenses for a series of performances.

The license to possess and carry fire-arms is also omitted, for the reason that a separate license is issued for each fire-arm, and it frequently happens that from two to ten licenses are issued to one individual.

DETAILED STATEMENT OF GOVERNMENT REALIZATIONS—RECEIPTS OF INTERIOR DEPARTMENT FOR TWO YEARS ENDING DECEMBER 31, 1897.

	1896.	1897.	Total.
FEES—			
Brands, Registry of...	$ 14.00	$ 16.00	$ 30.00
Building Permits	895.00	1,022.50	1,917.50
Candidates, for Representative	.....	550.00	550.00
Certificates, verifying documents	5.50	22.00	27.50
Certificates in re publications	11.50	12.00	23.50
Charters, recording of.	155.10	203.00	358.10
Dis-incorporation	5.00	20.00	25.00

FEES—	1896.	1897.	Total.
Patents of Invention, Caveats, Copy-rights, Labels and Trade Marks	210.00	130.00	340.00
Permission to Assign, Transfer or Mortgage Government Lease	5.00	5.00	10.00
Registry of Copartnership	83.50	121.00	204.50
Registry of Women trading in their own name	1.00	2.00	3.00
SALES—			
Animals, Government, condemned	86.50	79.90	166.40
Buildings, Lumber, etc., old	133.45	193.00	326.45
Cemetery lots, Makiki.	400.00	.....	400.00
Locomotive, condemned	100.00	.....	100.00
Manure, soil, sand, coral, etc.	1,035.60	900.25	1,935.85
Old Copper	195.40	.....	195.40
Old Iron, etc.	337.51	198.50	536.01
Sundry old materials..	124.50	44.01	168.51
SUNDRY—			
Gunpowder Storage ..	993.93	397.59	1,391.52
Government Survey, Sales of Maps, etc..	29.00	45.50	74.50

Hawaiian Electric Co., 2½% on Gross Receipts	622.72	787.72	1,410.44
Steam Roller, Carts, Prison labor, etc. . . .	104.40	89.50	193.90
Pound Balances, unclaimed	. . . . .	52.50	52.50
Return of Duplicate payments, etc.	83.36	248.93	332.29
	$5,631.97	$5,140.90	$10,772.87

The following suggestions in regard to the working of some portions of the License Act of 1896 are respectfully submitted.

ALCOHOL LICENSE.

Section 9 of the Act authorizes the Minister of the Interior to grant any holder of a license to sell poisonous "or other drugs," a license to sell Methylated Spirits and Alcohol.

As the sale of "Poisonous Drugs" requires a special license and the sale of all drugs other than poisonous, would be admissable under a merchandise license, there is no doubt that the intention was to restrict this privilege to the holders of drug licenses. If so, it would be advisable to amend this Section by striking out the words "and other."

Section 12 limits the amount of Alcohol to be withdrawn from Bond by the holder of a license, to 150 gal-

lons in any one year, upon the payment of two dollars per gallon, and all in excess of that quantity to pay the full spirit duty, according to its strength.

Two of the large drug houses of Honolulu withdrew from Bond to the 150 gallon limit before the expiration of the year and petitioned that the limit be increased under their license to 300 gallons.

This of course could not be allowed as the Collector-General was bound by law to collect the spirit duty on all in excess of 150 gallons.

In view of the fact that the holders of this class of license are few and in view also of the fact that they are required to give a Bond to the Minister of the Interior in the sum of One Thousand Dollars and also to file a sworn monthly statement in the Interior office, showing in detail the amount used for extracts and prescriptions and the amount sold to each physician, I would recommend that the limit in quantity of Alcohol, be increased to 300 gallons at a duty of Two Dollars and that all in excess of that quantity, pay the full spirit duty as provided in the Act.

AWA LICENSES.

Section 18 of the Act authorizes the Minister of the Interior to sell at Public Auction one license annually, to sell Awa in each taxation district, at an upset price as fixed by the schedule in Section 21.

It is further provided that twenty-five per cent. of the amount bid shall be deposited upon the fall of the hammer, the deposit to be forfeited if the balance is not paid within five days.

Section 23 reads: "In case of failure to sell any license, or of such forfeiture, the license shall be again advertised, etc."

As in some of the districts, no bid is ever received for such license, the words "failure to sell any license" should be stricken out, so that the Section would apply to forfeitures only.

It is worthy of note that in the District of Hilo, where the upset price is fixed at $500, and where in former years two licenses were sold at large figures, there has been no bid for the purchase of a license for either 1897 or 1898.

The Revenue from the sale of these licenses amounted in the biennial period of 1884-86 to $21,758, but the receipts have gradually decreased until those for 1896-97 amount to $7,783.85.

BUTCHER LICENSES.

Section 49 reads: "The annual fee for a license to slaughter and sell Beef shall be One Hundred Dollars for the District of Honolulu and Twenty Dollars for all other Districts, and Sections 53 and 54, relating to the slaughter and sale of Pork are worded in a like manner, fixing the fee for the slaughter and sale of Pork in the District of Honolulu at Forty Dollars and Twenty Dollars for all other Districts, and to sell Pork in the District of Honolulu Twenty Dollars.

Outside of Honolulu, no provision is made for a license to parties who may sell either Beef or Pork that has been slaughtered by others, and it was probably taken for granted that in the outer districts each butcher would do his own slaughtering.

Such however does not appear to be always the case, as several instances have been reported where a Plantation or Ranch does the slaughtering and disposes of the meat or a portion of it, to others who in turn retail it out.

A case is reported by the Sheriff of Hawaii where a party arrested for selling Pork without a license, was acquitted by the Judge on the ground that a license was only required when the party "slaughtered and sold" and there was no proof that the defendant had slaughtered the animal.

As there is a possibility of instances in the outer districts where the slaughtered animal is sold to the retailer, without either party having a license and with no record kept of the animal killed, it would seem but fair that the venders of meat in those districts should be licensed at some reasonable fee. The original object of the Butcher license was to insure a proper record of all cattle slaughtered and the licensed seller could be readily located and would be of great assistance to the Police in tracing the record of slaughtered animals when required.

LICENSE TO SELL TOBACCO, CIGARS AND CIGARETTES.

Section 96 of Act 64, of the Laws of 1896, reads as follows:

"The Annual fee for a license to sell Tobacco, Cigars and Cigarettes shall be Ten Dollars. The payment of this fee shall not be construed to exempt the holder from the payment of a fee for a Merchandise License as provided for by Section 75 of this Act."

The fee for a Merchandise License of the lowest grade

is Fifty Dollars and under the wording of this Section, a person selling Tobacco, Cigars and Cigarettes only, would have to obtain in addition to the Ten Dollar license, a Fifty Dollars license to sell Merchandise.

It has been customary for the keepers of Restaurants and Coffee shops to sell Cigars at retail to their customers, as a recognized adjunct to their business and except in some few instances where the sales were in quantities and the usual stock of smokers' supplies other than tobacco manufactures, were kept for sale, the requirement for a license to sell imported merchandise has not been enforced. The same custom has applied to holders of Retail Spirit Licenses, who as a matter of convenience furnish cigars to their patrons when called for.

Upon the passage of the Act of 1896, I gave instructions that applicants for a Tobacco, Cigar and Cigarette License must also obtain a Merchandise License.

The Hotel and Restaurant Keepers who pay an annual license fee of Fifty Dollars, while willing to pay the additional fee of Ten Dollars for a Tobacco License, complain against the requirement of a Fifty Dollar Merchandise fee in addition. But as the law now stands, I am advised by the Attorney General that I cannot waive such requirement.

I would therefore recommend that the law be amended so that the holders of Hotel and Restaurant Licenses, who are also the holders of Tobacco, Cigar and Cigarette Licenses, be exempted from the requirement for a Merchandise License in addition thereto.

NOTARIES PUBLIC.

That portion of Section 83 relating to the licenses of Notaries Public reads:

"The annual fee for a license to act as Notary Public or as an Agent to take Acknowledgments, shall be Ten Dollars for Honolulu and Five Dollars for all other Districts."

The jurisdiction of a Notary Public covers the Judicial Circuit for which he is commissioned and of these Circuits—the first, second, third and fifth, each cover five Districts, and the fourth contains four.

With his Commission from this Department as full authority for his official acts throughout his circuit, he would nevertheless be required either to hold a license for each separate District. Confine his acts to the one for which he might hold a license or be liable under the penalty prescribed by Section 4 of the License Act.

For the convenience of those holding minor offices in the outer Districts, and who are required under the Audit Act to make sworn monthly statements; competent residents have been induced to accept this appointment, who otherwise would not care for it, certainly not on account of the fee for administration of an oath, which is twenty-five cents.

While the penalty for acting without a license is not severe, and would possibly not vitiate an act done under authority of a commission, yet I am satisfied that a majority of the Notaries, would from conscientious scruples, decline to act outside of their licensed jurisdiction. For this reason and for the fact that the terms of the license

Patents issued during the above period as follows:

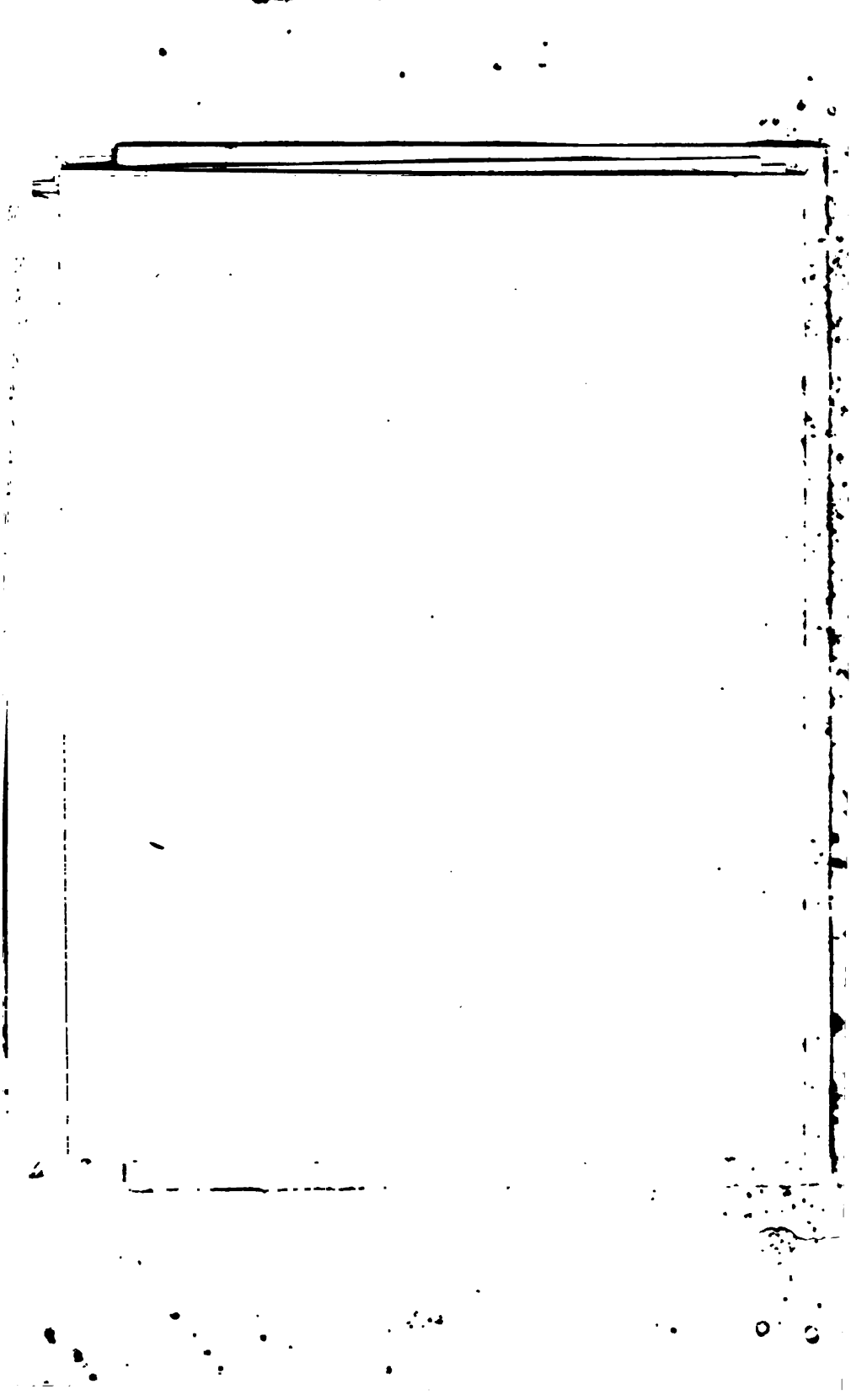
On Homesteads	195
" Olaa reservation	50
" Puukapu reservation	1
" Time payment	18
" Cash purchase	20
" Exchanges	8
" Equitable settlement	2
" Perfecting title	2
" Land Commission award	36
	332

Fees amounting to $1,505 were received from this source.

The classed statement above shows that the number of Patents issued during the two years was 332. The number issued for the two previous years was 194, showing an increase of 138.

PATENT RECORDS.

Under the appropriation made by the last Legislature the duties of the Land Patent Clerk were combined with those of copying the original Patent Records in order that these latter might be saved from the constant handling to which they were subjected by abstracters and searchers. An appropriation for the purchase of the necessary record books was also made. This work was not commenced until the first week of November, 1896. The delay was partly caused by the time required to prepare suitable record books and partly on account of the clerk



LEASES.

As will be seen by the Interior Department Rent Roll, forty (40) new leases and two (2) rentals to tenants, have been issued by this Department during the two years and seventy-three (73) leases transferred to this Department from the Kapiolani Park Association, making a total of one hundred and thirteen (113) new leases on said Rent Roll.

Total rental of leases made prior to 1896, less 15 leases which have expired	$ 19,240
Total rental of leases during these two years	14,754
Present annual rent income as appears on the Interior Department Rent Roll, December 31, 1897	33,994

HAWAIIAN CORPORATIONS.

Thirty-three Corporations for Mercantile, Manufacturing or Agricultural purposes, six for Church or Literary purposes and one Banking Corporation, filed their Articles of Association during the Biennial Period just closed. Five Mercantile and one Church Corporation amended their Charters and two Corporations were dissolved.

Quite a number of the Incorporated Companies fail to make an Annual Statement of their Assets and Liabilities and some of these Associations may be classed as of doubtful existence. But there is no provision for disposing of any Corporation which may cease to exist,

CHARTERS TO CORPORATIONS FOR MERCANTILE, AGRICULTURAL AND MANUFACTURING PURPOSES, ISSUED DURING THE TWO YEARS ENDING DECEMBER 31ST, 1897.

Name of Corporations.	Date of Filing	Term of Years	Capital Stock.	No. of Shares	Par Value.
Capital Coffee and Commercial Co..	Jan. 20, 1896	50	$170,000 00	1700	$ 100 00
Pacific Immigration Co.....	Mar. 11, 1896	25	70,000 00	700	100 00
Aloha Coffee Co...	Apr. 2, 1896	50	20,000 00	1000	20 00
Lahaina Coffee and Fruit Co.....	Apr. 7, 1896	50	100,000 00	1000	100 00
Ponahawai Coffee Co.....	Apr. 23, 1896	50	15,000 00	150	100 00
Makaha Coffee Co.	June 5, 1896	50	30,000 00	300	100 00
Oahu Lumber and Building Co...	June 12, 1896	50	50,000 00	500	100 00
W. C. Peacock & Co	July 1, 1896	50	100,000 00	1000	100 00
South Kona Coffee Co.....	July 21, 1896	50	50,000 00	500	100 00
Hamoa Plantation Co.....	Sept. 10, 1896	50	175,000 00	1750	100 00
Hawaii Herald Publishing Co..	Nov. 16, 1896	25	5,000 00	100	50 00
Hawaii Railroad Co	Nov. 23, 1896	50	50,000 00	100	500 00
Lanai Land and Development Co.	Dec. 14. 1896	50	250.000 00	2500	100 00
Native Sons Co...	Dec. 28, 1896	50	5,000 00	200	25 00
Aloha Aina Oiaio Co.....	Dec. 29, 1896	25	3,000 00	600	5 00
Waterhouse Investment Co.....	Dec. 29, 1896	50	152,000 00	1520	100 00
Hui Kalepa Hookuonoono H'waii	Jan. 27, 1897	25	5.000 00	5000	1 00
Enterprise Mill Co.	Jan. 30, 1897	50	30,000 00	300	100 00
Davey Photograph Co.....	Feb. 12, 1897	50	10,000 00	100	100 00

CHARTERS TO CORPORATIONS FOR MERCANTILE, AGRICULTURAL AND MANUFACTURING PURPOSES ISSUED DURING THE TWO YEARS ENDING DECEMBER 31ST, 1897.

Name of Corporation.	Date of Filing.	Term of Yrs	Capital Stock.	No. of Shares	Par Value.
Hilo Mercantile Co	Feb. 23, 1897	50	$ 100,000 00	1,000	100 00
Pacific Cycle and Manufacturing Co	Feb. 24, 1897	50	10,000 00	200	50 00
Oahu Sugar Co	Mar. 30, 1897	50	1,800,000 00	18,000	100 00
Lihue Ice and Electric Power Co	May 30, 1897	50	5,000 00	500	10 00
Liko Lehua Coffee Co	June 30, 1897	50	10,000 00	100	100 00
Hawaiian Chinese Kona Coffee Plantation	July 6, 1897	50	20,000 00	200	100 00
Awini Coffee, Fruit and Stock Co	July 17, 1897	50	8,750 00	35	250 00
John Ii Estate	July 20, 1897	50	150,000 00	1,500	100 00
Club Stables	Oct. 4, 1897	50	15,000 00	150	100 00
Hart & Co	Oct. 26, 1897	50	30,000 00	3,000	10 00
Gonsalves & Co	Dec. 15, 1897	50	70,000 00	700	100 00
The Bank of Hawaii	Dec. 17, 1897	50	400,000 00	4,000	100 00
The Kohala Klondyke Mining Co.	Dec. 21, 1897	50	50,000 00	50,000	1 00
H. Hackfeld & Co	Dec. 24, 1897	50	1,000,000 00	10,000	100 00
Kailua Coffee Co	Dec. 28, 1897	50	40,000 00	400	100 00

ASSOCIATIONS CHARTERED FOR CHURCH AND LITERARY PURPOSES.

April 17, 1896. Hilo Library and Reading Room Association.
May 6, 1896. Wailuku Church of Wailuku, Maui.
August 5, 1896. Christian Church of Honolulu.
March 23, 1897. Wainee Church of Lahaina, Maui.
May 31, 1897. First Japanese Methodist Episcopal Church of Honolulu.
June 18, 1897. See Yup Wai Quan (Benevolent Society).

CHARTERS AMENDED.

DATE.	CORPORATION.	
May 16, 1896	Hilo Electric Light Co.....	Increasing Capital Stock to $50,000, and granting privilege to engage in the Manufacture of Ice, etc.
Oct. 1, 1896	Queens Hospital.	Changing the wording in some of the Sections to Conform to the present Government. ...
Nov. 13, 1896	Onomea Sugar Co	Increasing Capital Stock to $600,000, with privilege of subsequent extension to $ 1, 000,000
Dec. 19, 1896	Honokaa Sugar Co	Increasing Capital Stock to $500,000
May 13, 1897	Union Feed Co..	Increasing the Capital Stock to $ 75,000, and increasing the par value of shares from $50, to $100 each
Sept. 13, 1897	First Foreign Church and Society of Hilo	Allowing an increase of property value, from $10,000 to $50,000

CHARTERS RENEWED

DATE	CORPORATION.	
Dec 22, 1896	Honolulu Iron Works Co.....	Term 50 years. Capital Stock $100,000

CORPORATIONS DISSOLVED.

March 9, 1897. Hawaiian Railroad Co.
April 17, 1897. Paukaa Sugar Co.

Appended hereto, I beg to submit the Reports of the several Bureaus of this Department as follows:

Bureau of Government Survey.
Bureau of Public Works.
Bureau of Water Works.
Clerk of the Market.
Board of Fire Commissioners.
Supervisor of Honolulu Roads.
Bureau of Conveyances.
Bureau of Agriculture and Forestry.
Commissioner of Patents.

The Report of the Bureau of Immigration I have deemed it advisable to publish under separate cover.

I have the honor to be Sir,

Your obedient servant,

J. A. KING,
Minister of the Interior.

To MR. SANFORD B. DOLE,
President of the Republic of Hawaii.

REPORT

OF THE

BUREAU OF GOVERNMENT SURVEYING

FOR THE

BIENNIAL PERIOD ENDING DECEMBER 31, 1897.

TO J. A. KING,
Minister of the Interior.

SIR:—I have the honor to submit to you the following report of the Bureau of Government Surveying for the biennial period ending December 31, 1897. During this period the important public improvements in progress or projected have required the services of our staff in many ways. The long illness of Mr. C. J. Lyons has deprived us of his valuable services, and his absence has been much regretted. The greater part of our work has been done in this district and on the Island of Hawaii.

HAWAII.

The general trigonometrical survey of the Island of Hawaii was resumed in July, 1896, by Mr. J. S. Emerson in South Hilo, with the view of continuing it through

Puna and Kau to connect with the triangulation brought down the west side of Hawaii to Ka Lae, so as to close the geodetic survey of that island. He was assisted during the first six weeks by Prof. A. L. Colsten of Oahu College.

A great deal of difficult preliminary work had to be done in selecting stations and erecting signals. The primary stations on Kulani Hill, on Heiheiahulu, Kaiholena and other points, required a great deal of labor and expense in cutting paths through the dense jungle, in clearing the tops of wooded hills and building signals. This work was done in the most thorough and solid manner. Many of the triangle sides were more than thirty miles in length, but by exercising great care and ingenuity in building conspicuous signals, Mr. Emerson succeeded in making all the required observations without having to employ heliotropers. The stations at Olaa and on Halai hill were occupied with the 12-inch theodolite by Troughton and Simms, and the other stations with the 6-inch transit by the same makers.

As is usual in that region, the work was considerably hindered by rainy and foggy weather. In the early part of 1897, the work was also hindered by smoke from forest fires in Puna, and from the Volcano of Kilauea. In spite of these difficulties, gratifying progress has been made, and a solid foundation laid for future surveys in Puna and Kau.

The measurements that have been made are surprisingly accurate, considering the condition of the instruments used, the average closing error of 32 triangles being less than 5″, and the average error of any single angle about 1.6″.

The triangulation of Kau is not as yet fully completed. Puu Ulaula on the eastern slope of Mauna Loa, and another station to be selected on the south, have yet to be occupied, and some other stations in Kau will have to be reoccupied, in order to complete the work satisfactorily. Although the chain of triangles is unfinished, some of the stations not having been occupied, and some of the triangles having been measured with a four inch transit, Mr. Emerson has worked up the data at hand, and compared the position of Puu Enuhe as deduced from the chain of triangles carried from Waimea through Hamakua, Hilo and Puna, with that deduced from the other chain carried down the west coast of Hawaii from Waimea to Kau. The result of this preliminary test is quite satisfactory, and proves that the framework of the general survey of Hawaii is substantially correct. The discrepancy between the two results is in distance 69 feet, and in azimuth 0° 00′ 17″.

To my great regret, I felt myself compelled by the state of the appropriation for field work to recall Mr. Emerson about the end of May, 1897. Mr. E. D. Baldwin has been employed by this bureau in surveying the grades and lines of the existing and proposed streets in Hilo, and the exchanges of land proposed in connection with the widening of certain streets. Mr. S. M. Kanakanui was employed in December, 1896, in surveying and subdividing the lands adjoining Hookena, South Kona.

Mr. W. A. Wall in April, 1896, surveyed in detail the section between Keokea and Kalahiki, South Kona, partly on Government account. In the following November, he surveyed another section between Napoopoo and Kailua in North Kona, carefully locating all the

school and church lots for the Government, and furnished a map of the same to this office. In December, 1897, he also surveyed the land of Honalo in North Kona for the Government.

MOLOKAI.

The set of large scale section maps of Molokai was completed last year by the addition of a map of Halawa and adjacent lands on a scale of 1-600 and of a map of the eastern section of the Island on a scale of 1-12000.

The final map of the whole Island on a scale of 5,000 feet to the inch, was reduced from Mr. Monsarrat's maps and drawn in this office, in the early part of 1897, and has since been photo-lithographed by Julius Bien & Company of New York. The lithographed copies are expected daily.

OAHU.

A minute and accurate survey of the lands of Kaena, Kawaihapai and adjoining lands, was made in June, 1896, by Mr. J. S. Emerson, who identified many original corner marks of the main division lines, and executed a map of the section on a scale of 1-6000.

HONOLULU.

In reporting on the field work in this District as well as on the office work, I am much indebted to Mr. F. S. Dodge's reports of January 6, 1897 and December 31, 1897. After his return from the United States in Jan-

uary, 1896, Mr. Dodge devoted much time to the preparation of plans for projected street widenings and extensions, which were authorized by the succeeding Legislature. At the same time Mr. W. E. Wall was employed in the preparation of plans and surveys in connection with the Nuuanu river improvements, and the necessary transfers of real estate occasioned by the same. Lines of level were also run over most of the streets of the city, preliminary to the establishment of the official grades.

PLANS FOR SEWERAGE AND DRAINAGE.

In August, 1896, the Executive Council authorized a contract with Mr. Rudolph Hering, C. E., for the preparation of plans and specifications for the sewerage and drainage of Honolulu, and on his acceptance of it, the preliminary work for it was performed in this office, mainly by Mr. F. S. Dodge. A large map of Honolulu on a scale of 200 feet to one inch, was prepared, showing all the existing as well as the proposed streets, with the official grades. Besides this map a large amount of other information was compiled for Mr. Hering, including tidal and meteorological data. Mr. Hering arrived in Honolulu December 17, 1896, and spent a month in collecting information, and studying the problems involved in his undertaking. His complete plans and specifications for the sewerage and drainage of Honolulu have lately been received, and are on file in this office. The preparation of these elaborate plans by Mr. Hering required considerable correspondence on the part of Mr. Dodge, who had to duplicate a large part of the notes

which had been destroyed by fire in a railway accident. His report and plans for the filtration of the Nuuanu water supply have also been received.

OTHER CITY AND OFFICE WORK.

Mr. C. J. Willis, after resuming work in this office in July, 1896, has rendered valuable assistance in drawing maps and plans, and in particular, was employed under Mr. Dodge's direction, in drawing the fine map of the Island of Molokai, which has since been photo-lithographed in New York. On the 1st of September last, he was temporarily transferred to the service of the United States Navy, at the request of the Admiral commanding the Pacific station, and is now engaged in preparing the new chart of Pearl Harbor and bar, under the direction of Lieutenant Mayo of the U. S. S. Bennington.

Mr. S. M. Kanakanui has been employed constantly both as a draughtsman and as an assistant in field work. He has made a large number of copies of Land Office maps, and has furnished numerous tracings of maps for land sales and leases as well as for other purposes.

The original surveys of school and church sites made in 1851-3 have all been copied into a suitable book and properly indexed.

Mr. W. E. Wall's city work has included a detailed resurvey of that section of Honolulu near the Iron Works, of which he has drawn a map on a scale of 20 feet to the inch, showing all existing titles. He has also furnished many street lines and grades throughout the city and street profiles for the Commissioners of Grades and Sidewalks.

After Mr. Emerson's return from Hawaii, he completed the calculations connected with his work, and a map showing his scheme of triangulation. He was then employed in a detailed survey of that portion of Honolulu above Beretania street, between Nuuanu and Emma streets, of which he is executing large scale plans showing all buildings and fences, with the present titles of all real estate holdings as well as the original awards and grants.

As city surveyor, Mr. Dodge has had general oversight of street lines and grades and the opening of new streets, besides sidewalk improvements, in which notable progress has been made during the past two years. The Land Commission, of which he is a member, has also made frequent demands on his time.

METEOROLOGY, ETC.

The regular work of the Weather Service has been kept up during the biennial period, notwithstanding the regretted absence of Mr. C. J. Lyons, who was compelled by ill health to give up his work in June, 1896.

The meteorological observations of the years 1894 and 1895, were arranged, tabulated and prepared for publication with the assistance of Dr. A. B. Lyons, and were published in August, 1897.

A similar pamphlet, containing the observations of the years 1896 and 1897, is in the course of preparation.

Time observations have been regularly made every week, by which the standard clock and the chronometers in the office are rated, and time signals are given daily at local noon and Greenwich midnight. The self-regis-

tering tide-gauge has been kept in operation, a daily record being taken from the instrument, and a duplicate copy made for the U. S. Hydrographical Office. The predicted times of the tides, of sunrise and sunset, and of moonrise have been regularly furnished from this office for publication.

OFFICE MATTERS.

A large new book-case for our library of miscellaneous books, scientific reports, etc., has just been finished, and will be a great convenience. A new case of drawers will soon be needed for the increasing number of large city block maps. I would decidedly approve of the plan suggested by the Superintendent of Public Works, to render the map rooms fire-proof.

A new alphabetical index of all registered maps and plans, has been prepared, showing the date and authorship of each and its place in the office. Ninety-five new maps have been registered during the past year, making a total of 1,915. A new register and index of all copies of surveys furnished, has also been prepared, showing a total of 850 to date. The registered documents of a miscellaneous character other than maps, plans and surveys, now number 271. The miscellaneous work of the office during the past biennial period includes the following:

Tracings furnished for various purposes	188
Reports upon applications for public lands	66
Reports on various subjects to the Minister of the Interior	63
Miscellaneous letters and reports on office business	301
Copies of surveys furnished	220

PROPOSALS FOR FUTURE WORK.

The triangulation of the Island of Hawaii, which is so nearly finished, should be taken up again and completed without delay.

In order to complete the general survey of the windward Islands, it seems desirable to occupy the primary station on Kahoolawe, so as to perfect the connection of the survey of Maui with that of Hawaii.

It is also time that the final trigonometrical survey of the Island of Kauai should be taken up and pushed to completion.

The numerous public improvements under way or projected, will continue to call for the services of this bureau. Under the provisions of the Land Act there will, no doubt, be a great and increasing demand for surveys of the class of lands which have been placed under the charge of the Land Commission.

As has been stated in a former report, a new map should be published of the whole group, as well as a new one of the Island of Oahu, and a set of section maps of the Island of Hawaii. It is also intended to construct a relief map of Hawaii, similar to those of Oahu and Maui in this office.

ESTIMATES.

I beg leave to submit the following estimate of the requirements of the Bureau of Surveying for the biennial period ending December 31, 1899, viz.:

Salary of the Surveyor General	$ 6,000.00
" " " Assistant in charge of office and city work.....	5,400.00

Salary of the Assistant in city and general work		4,800.00
" " " Assistant in general work		4,800.00
" " " Sub-assistant in general work.		2,400.00
" " " Draughtsman		1,800.00
" " " Aid		1,200.00
" " " Messenger		960.00
Total salaries	$	27,360.00
Expenses of field parties for the general survey	$	10,000.00
" " Office, instruments, maps, etc . . .		2,000.00
" " Meteorology and tide gauge		1,200.00
Total expenses of Bureau of Surveying .	$	13,200.00

I have the honor to remain

Your obedient servant,

W. D. ALEXANDER,
Surveyor-General.

APPENDIX.

REPORT BY MR. J. S. EMERSON.

December 22, 1897.

W. D. ALEXANDER,
Surveyor-General:

DEAR SIR:—The object of my work on Hawaii, as stated in your letter to me of July 13, 1896, was "in general to revise and complete the primary triangulation of Puna, and continue it into Kau to connect with the previous surveys" of Mr. Monsarrat and myself "in that District."

In accordance with these instructions, after informing myself with regard to the work already done in Puna by Mr. E. D. Baldwin and his assistant, Mr. F. W. Thrum, I took passage for Hawaii, and arrived in Hilo July 19. I was accompanied by Mr. A. L. Colsten, who remained with me, and rendered valuable service in the instrumental work until the 20th of August, when he left me to carry out your orders for a survey of the Volcano. From that time on with the assistance of native laborers, I continued the work alone, and with the exception of two weeks spent in Honolulu at Christmas time, I remained at my work on Hawaii until I received your letter of May 17th, of the present year, saying that "the state of the appropriation for Field Expenses compels us to cut

short our operations without delay," when I at once turned my face homeward, arriving in Honolulu on the 26th of May, 1897.

One of the marked features of the survey was the great distance between many of the stations that have to be directly connected by triangulation. In repeated instances, it was thirty miles or more. The great difficulty and expense of sending competent persons with heliotropes to the required stations, determined me to do without them. In order to expedite matters, I sent experienced native men to reset the signals on all the old stations, which I proposed to observe from a given point.

Although this preliminary flagging was done in haste and in a rather unsatisfactory manner, yet I was thus enabled to begin instrumental work almost at once. The first thing which I did after encamping at a station was to prepare a solid foundation on which the instrument might securely rest, and a smooth and level circular standing place for the observer, so that he might walk comfortably about the instrument without fear of jarring it. On such hills as Kulani, Puu Enuhe and Kaiholena, suitable rock could not be obtained. Three ohia logs sunk vertically in the ground, furnished an admirable substitute for rock.

The soft vegetable mould was entirely removed for a radius of five or six feet about the center of the station, and hard earth rammed solidly in its place. The wind on many of these exposed hills blows at times with great violence. To protect myself from this disturbance, I built up a solid circular wall five feet in height around the station, with a radius sufficient to allow me to move

freely within the wall and around the instrument. Where the wind was exceptionally strong, as at Puu Huluhulu, a cloth screen with loopholes for observing was secured above the wall. As a protection from the sun and rain, a canvas awning was placed over all. At Kaloli I was obliged to construct a fortress of rock, roofed over with canvas, to protect me from the surf, which dashed in fury against the rock-bound coast, and at times swept in blinding spray past the spot on which my observatory stood. By actual measurement, the surf at this point reached a height of fifty feet above sea level, while my station mark was only thirty feet above the same level.

During the time spent at a station, my men were kept busily employed in cutting down all the trees and clearing off the brush that might obstruct or confuse the view of the signal from other stations. Ample material for the construction of a first-class signal was also piled up in readiness for immediate use the moment the instrumental work should be completed. The work of building up a signal, it will be observed, was thus already well advanced before the instrument was removed.

The station mark of rock or concrete was in its place. The outer wall of the base of the structure was securely resting on suitably prepared foundations. It remained to put the vertical flag pole, from twenty to twenty-four feet in length, in its place, and to fill up the interior of the wall about the pole, flush with its upper surface. The material used was in every case rock or fern logs. Upon this cylindrical base a small cylinder was built up, and upon that a still smaller one, until the structure terminated in a small cone at a height of from fourteen to

sixteen feet above the ground. The flag pole and the upper portion of the structure supporting it were securely covered with white cloth, and a large white flag was attached to the top of the pole. For an unfrequented station, the style of signal above described gives better results than any thing yet constructed on these Islands. By them we have connected stations at a distance of over thirty miles without the use of a heliotrope. The great labor involved in taking them down to occupy their place with an instrument and again replacing them, will always prevent their adoption at those stations which are to be frequently visited by local surveyors.

The ordinary tripod signal, so convenient on account of its easy adjustment, is a complete failure in long distance work. The strong winds tear the insecure cloth from its limbs, until the poor naked skeleton seems to shiver in the blast, and its ghost-like appearance taxes the weary eyes of the observer beyond endurance. The importance of thoroughly clearing the entire top of a hill about a signal, of brush and trees, cannot be insisted upon too strongly. The time spent in such work while at a station is amply compensated for by the ease which which it can be identified, and the precision with which it can be observed from other distant stations. In short, it gives a clear back-ground of sky, instead of a confused and uncertain blending of the signal with its surroundings.

The instruments used were, at Olaa and Halai the twelve-inch Troughton & Simms's transit, and at the remaining stations a six-inch transit from the same makers. The mechanical working of these instruments was in neither case at first satisfactory. But after a time it became apparent how their defects could be remedied. I

was fortunate in securing the services of such a mechanic as Mr. S. H. Webb of Hilo. With his aid I had the instruments put in thorough repair, so that at length I secured in their working a higher degree of precision than any thing I had previously attained.

During the latter part of the month of January, 1897, the fires for clearing land in the Districts of Hilo and Puna filled the air with so much smoke, that to escape it, I moved into Kau. But from smoke there was no escape. The Volcano continually poured out a great volume of obscurity day and night, week after week. It was a great source of annoyance and a continual hindrance to the prosecution of my work.

It was fortunate for me that Mr. Baldwin had shown such good judgment in selecting the stations in Hilo and Puna. In only one case, that of Heiheiahulu in Puna, was I obliged to change the location of his station. There I found it necessary to abandon the old site and adopt a new one on another part of the same hill.

Let me here acknowledge the valued assistance I have received from him and from Mr. Thrum. I have carefully tested their observations and found that they give good satisfaction. With the single exception already noticed, I used Mr. Baldwin's stations unchanged as far as to the Volcano. The triangulation scheme up to that point is a satisfactory one, and the stations are well chosen. Aahuwela on Mauna Kea has proved to be a judicious selection. It is an essential point in this important chain of triangles.

From the Volcano on towards Kau, the triangulation scheme is not as yet fully complete. A new station must be added on the spur of Mauna Loa to the south of Puu

Ulaula, to connect that pivotal station with Kaiholena and other stations in Kau. The occupation of Puu Ulaula and its companion station, yet to be selected on Mauna Loa, will doubtless be a matter of no little difficulty, as they are peculiarly exposed to the cold wind, while water and fuel will have to be brought from a great distance over frightful lava flows. These difficulties, however, should not stand in the way of their occupation.

Transportation over such a District as the one under consideration is attended with peculiar difficulty. Save along the stage route from Hilo to the Volcano, everything was packed on mules. How to provide the poor animals with food and water has often been a most serious problem.

To reach Kulani with my pack train involved the labor of cutting my way and constructing a path through a dense koa forest. Nine working days were thus spent, but the road secured has been and will again be a great help in the survey. Heiheiahulu and Kaliu were also difficult of access, and to occupy them required the carrying of baggage for long distances on men's shoulders. Kaiholena is a lofty hill, or isolated mountain peak, up whose steep sides we slowly cut our way through a dense jungle. In the midst of the ascent, one of my men was disabled by an unfortunate cut from the knife of the man in his rear, who was pressing too closely after him.

The district included in our triangulation is covered by stations as follows:

Number of first-class stations	19	
Number of second-class stations	4	
		— 23

Number of first-class stations occupied by myself	14	
Number of second-class stations occupied by myself	1	
Number of first-class stations occupied solely by Baldwin	1	
Number of first-class stations occupied solely by F. W. Thrum	1	
Number of first-class stations not occupied	3	
Number of second-class stations not occupied	3	
		23

The three first-class stations yet to be occupied are Puu Ulaula, Kamak'aia and Pu'ula. The three second-class stations incidentally located are Anapuka, Honuaula and Kauhao, besides Heiheiahulu as already explained, which was abandoned in favor of West Heiheiahulu.

The following tabulated statement gives the names of the stations, the time of their occupation, number of stations observed both primary and secondary, and the average number of repetitions of each angle measured:

Primary Sta. Observer J. S. Emerson	When Occupied 1897	Number 1st. class Signals observed	Number 2d. class Signals observed	Number Repetitions 1st class Signals.	Number Repetitions 2d class Signals.	Average No. Repetitions 1st class	Total No. Repetitions 1st & 2d class
Halai	Jan. 12-30	7	2	154	34	25.7	188
Kahaha	Mar. 26-Ap. 3	3	1	130	24	26.0	154
Kaiholena	Mar. 3-13	6	0	104	0	20.8	104
Kaliu	Aug. 11-18	4	0	70	12	23 3	84
Kaloli	Oct. 12-19	7	2	120	30	20.0	150
Kamehame	Mar. 18-22	4	1	90	24	30.0	114
Kapoho	1896 Sept. 18-Oct. 9	7	2	176	46	29.3	222
Kulani	Nov. 25 Dec. 11.	11	1	220	6	22.0	226
Ohale	1897 May 13-18	6	1	84	4	16.8	88
Olaa	1896 July. 28-Aug. 7 Oct. 30 Nov. 10 1897	6	3	174	80	34.8	254
Puu Enuhe	Feb. 20-25	3	0	48	24	24.0	72
Puu Huluhulu	Apr. 24 May 8	8	1	128	40	18.3	168
Uuwekahuna	1896 Dec. 14-1897 Feb. 4-6 & Apr. 9-21 1896	7	1	252	16	42.0	268
W. Heiheiahulu 2ndary Sta	Aug. 31 Sept. 14	8	2	162	56	23.1	218
Heiheiahulu Primary Sta. F. W. Thrum	Aug. 24-28 1891	4	1	48	2	16.0	50
Obs. Aahuwela. F. W. Thrum.	Jun. 22 Aug. 8	6	1	373	28	74.6	401
Ku ani. Primary Sta. E. D. Baldwin Observer	Sept. 14–28 1890	8	0	228	0	32.6	228
Alala	Feb. 4–15 1889–90	5	1	148	32	37.0	180
Halai.	Dec. 16 Jan. 2.	5	0	232	0	58 0	232

In the present unfinished condition of the work, the number of triangles whose angles have all been measured is 32.

Average closing error per triangle.....4.65″
Average closing error per angle.....1.65″

Though the connection of the District north-east of the Volcano with Puu Enuhe is far from complete, yet as a preliminary test of the accuracy of the triangulation of the whole Island, I have worked up such data as we have, and compared the location of Puu Enuhe as thus obtained with Mr. F. S. Dodge's location of the same point from data taken from Mr. M. D. Monsarrat's work in Kau. In other words, taking the entire chain of triangles around the Island of Hawaii as developed by yourself, Mr. C. J. Lyons, M. D. Monsarrat, E. D. Baldwin, F. W. Thrum and myself, we compare the latitude and longitude of the meeting point as obtained from each end of the chain. This comparison shows a discrepancy in the results of these two sets of calculations, as follows:

Difference in linear distance 69.9 feet.
Difference in azimuth 0° 0′ 17″.

When we consider that Mr. Monsarrat's work in Kau was done with a four-inch transit, and that some of the stations to the north-east of Puu Enuhe, to be used in its final location, have not yet been occupied, we can only feel gratified that this preliminary comparison of results shows so slight a divergence.

In conclusion, I wish to express my thanks to the many kind friends who have in various ways assisted me. But

especially honorable mention is due to my faithful and trusted native laborer, Keanaha, to whose energy and intelligence I owe much of the comfort and success of a long, difficult and at times dangerous campaign.

Respectfully submitted.

J. S. Emerson,

REPORT

OF THE

Superintendent of Water Works.

HONOLULU, H. I., December 31, 1897.

J. A. KING, MINISTER OF THE INTERIOR;

SIR:—I have the honor of presenting my report as Superintendent of the Bureau of Water Works for Honolulu for the period from January 1st, 1896, to December 31st, 1897.

APPROPRIATIONS.

The appropriations available for the work of this Bureau during the period were as follows:

Running Expenses	$ 7,500.00
Repairs to Reservoirs	5,000.00
General Repairs	12,000.00
Running Expenses Pumping Plants	16,000.00
Additions to Water Works, Honolulu	29,000.00
	$ 69,500.00

EXPENDITURES.

The expenditures for the period have been as follows:

Running Expenses	$ 7,424.25
Repairs to Reservoirs	5,000.00
General Repairs	11,944.03
Running Expenses Pumping Plants	16,000.00
Additions to Water Works, Honolulu	29,000.00
	$ 69,368.28

UNEXPENDED BALANCES.

Running Expenses	$ 75.75
General Repairs	55.97
	$ 131.72

REVENUE OF THE BUREAU.

The receipts of the Bureau during the period were $122,191.75, which were received from the following sources:

City Water Rates	$ 98,465.40
Ten per cent. Penalty	2,206.30
Shipping	19,587.90
Labor and Material	1,932.15
	$122,191.75

NEW PRIVILEGES.

Four hundred and fourteen new privileges have been granted during the period, and rated as follows:

5	at	$ 5.00	per	annum
10	"	8.00	"	"
6	"	10.00	"	"
280	"	15.00	"	"
15	"	20.00	"	"
53	"	25.00	"	"
11	"	30.00	"	"
2	"	32.00	"	"
10	"	35.00	"	"
7	"	40.00	"	"
1	"	45.00	"	"
5	"	50.00	"	"
2	"	60.00	"	"
1	"	64.00	"	"
1	"	65.00	"	"
1	"	75.00	"	"
2	"	80.00	"	"
1	"	100.00	"	"
1	"	250.00	"	"
414				

PRIVILEGES DISCONTINUED.

Rate per annum.	Ordered cut off.	Cut for non-payment.	Total.
$ 5.00	0	1	1
10.00	3	24	27

15.00	12	53	65
20.00	0	2	2
25.00	9	4	13
35.00	1	0	1
	25	84	109

Total amount of Water Rates due on those cut for non-payment is $1,817.40.

Estimated receipts of the Bureau of Water Works, Honolulu, for the biennial period of 1898-9 $140,000.00.

WORK PERFORMED.—NEW PIPE.

1600 feet of 18 inch cast iron pipe has been laid on Alapai street, from Pump to Reservoir, with all necessary gates and fittings.

4500 feet of 12 inch cast iron pipe has been laid on Beretania and Makiki streets, from Keaumoku street to Makiki Reservoir, with all necessary gates and fittings.

5500 feet of 8 inch cast iron pipe has been laid on King street, from Nuuanu street to Thomas Square, with all necessary gates and fittings.

1800 feet of 6 inch cast iron pipe has been laid on Merchant street, from Nuuanu to Richard street, with all necessary gates and fittings.

The old pipe taken up has been cleaned and relaid as follows:

884 feet of 8 inch cast iron pipe has been laid on Wilder avenue, from Keaumoku to Punahou street.

3000 feet of 8 inch and 2100 feet of 4 inch cast iron pipe has been laid on Manoa Road, from Wilder avenue to Montana's.

2046 feet of 8 inch cast iron pipe has been laid on Liliha street, from King to School street.

1212 feet of 6 inch steel pipe has been laid on College street.

1400 feet of 6 inch steel pipe has been laid on Wyllie street.

662 feet of 4 inch, 226 feet of 3 inch, and 774 feet of 2 inch pipe has been laid on Liliha street, from Wyllie to Judd street.

1730 feet of steel pipe has been laid on the Prison road to the new Chinese Wash Houses.

525 feet of 3 inch steel pipe has been laid on the new street at Old Waikiki.

2667 feet of 4 inch cast iron pipe has been laid on Queen street, Kewalo Tract.

572 feet of 4 inch cast iron pipe has been laid on Hackfeld street.

465 feet of 4 inch cast iron pipe has been laid on Prospect street.

485 feet of 3 inch cast iron pipe has been laid on Vineyard street.

1300 feet of 3 inch cast iron pipe has been laid on Beach Road, Old Waikiki.

50 feet of 15 inch cast iron pipe has been laid at No. 1 Reservoir, with two 15 inch gates for a wash-out, and connections made so that, should it be required, the water can be piped direct from Luakaha to town.

A stone catcher has been placed above the Electric Light Station, and the 10 inch pipe replaced with 12 inch to increase the power and catch any stones that might get into the nozzles and interfere with the lights.

564 feet of 2 inch pipe has been laid from Queen street, makai, towards the oil warehouse.

The mains have been lowered on Judd, Lunalilo, Kinau, King, Queen and Fort streets and the Old Waikiki Road, to suit the change of grade.

I have had a great deal of repair work during the period, as some of the mains are very old, but hope to be able to replace them soon with new.

The Reservoirs have been cleaned and new strainers added, and the Springs above and below Luakaha have all been cleaned.

The keeper's house at Luakaha, the half-way house, the gate house and the house at Makiki have been overhauled and are in good repair at present.

50 new standing fire hydrants have been added to the system, and I have fifty more on hand which will be placed during the year.

PUMPING.

During the period it has been necessary to pump 1,130,067,011 gallons of water with a consumption of 1,315⅓ tons of coal.

The Makiki pumps and boilers have been overhauled and a new smoke stack added and are now in good repair.

The Beretania street pump and boilers have been also overhauled and a new set of springs and valves added and are in good condition at present. They will have to be run night and day to keep up with the increased demand for water, if Honolulu keeps growing as it has during the last twelve months.

RECOMMENDATIONS.

I would respectfully recommend that an appropriation of $65,000.00 be made for the purchase of 20,000 feet of 12 inch and 20,000 feet of 8 inch cast iron pipe, to be laid as follows:

The 12 inch on Punchbowl from head of Emma street along Wilder avenue, to Keaumoku street, the old pipe taken up will be laid on Prospect street and the higher levels on Makiki.

Also that a 12 inch be laid on King street from Liliha street to the fertilizer works, the 6 inch taken up to be laid on Kalihi and Kamehameha Roads.

The 8 inch will be laid on King street from Thomas Square to the "Sunny South" connecting with the 8 inch now on the Waikiki Road; and, from "San Souci" around the Park and out to the lots beyond Diamond Head.

I have petitions for water from the residents of the Park and Diamond Head, who are waiting to build as soon as they can get it.

There will be plenty of small mains for Puunui lots and other cross streets when the large mains are laid and the old ones taken up.

This amount will cover the expenses necessary for gates, fittings, lead, packing, cartage, laying, etc., etc., etc.

I would also ask for an appropriation of $60,000.00 for one triple expansion high duty pumping engine, capable of delivering 5,000,000 gallons water in twenty-four hours, against a fire pressure of 125 lbs. per sq. inch, with two water tube boilers.

This plant to be placed in Kapalama near the Insane Asylum.

For pumping engines, boilers, and foundations set in place, say, $40,000.

For wells, pump house, and fittings, say, $20,000.

Also that two more reservoirs be built, one on Diamond Head and one for the new pumping station, if we are successful in getting it.

Reservoirs, coming under the head of Public Works, will be handled in that Bureau.

ESTIMATED ACTUAL REQUIREMENTS OF THE BUREAU OF WATER WORKS, HONOLULU, FOR THE PERIOD OF 1898–9.

General repairs to Honolulu Water Works..	$ 12,000.00
Repairs to Reservoirs.....	8,000.00
Running Expenses Honolulu Water Works..	7,500.00
Running Expenses Pumping Plants.....	25,000.00
	$52,500.00

RUNNING EXPENSES HONOLULU WATER WORKS.

ITEMS.

Rent of Lands.....	$ 1,400.00
Horse Feed and Shoeing.....	1,500.00
Printing, Advertising and Stationary.....	1,300.00
Rent of Telephones.....	612.00
1,000 feet Hose.....	1,000.00
Tools	500.00
Horses	250.00

Wagons and Repairs	250.00
Medicines for Horses	100.00
Harness and Repairs	125.00
Taps and Fittings	463.00
Total	$ 7,500.00

RUNNING EXPENSES PUMPING PLANTS.

ITEMS.	
Coal	$ 15,225.00
Oil	300.00
Waste, Paint and Sundries	250.00
Labor, (Regular Run)	5,110.00
Labor, (Night Run, say 18 Months)	4,115.00
Total	$ 25,000.00

Respectfully submitted,

ANDREW BROWN,
Superintendent Honolulu Water Works.

REPORT

OF THE

CLERK OF THE MARKET.

Honolulu, December 31, 1897.

J. A. KING, Minister of the Interior:

SIR:—I have the honor to submit herewith my Report as Clerk of the Market for the biennial period, extending from January 1, 1896, to December 31, 1897.

RECEIPTS.

The receipts for the period have been as follows:

Monthly Rent from Stalls	$ 16,137.50
Transient Rent from Stalls	881.60
Total receipts	$ 17,019.10

EXPENDITURES.

There has been expended from the appropriation of $1,000 for "Running Expenses, Fish Market," the sum of $538.29, leaving an unexpended balance of $461.71.

The estimated receipts for the coming period are as follows:

ESTIMATED RECEIPTS.

Monthly Rent from Stalls	$ 18,000.00
Transient Rent from Stalls	1,000.00
Total	$ 19,000.00

ESTIMATED EXPENSES FOR THE PERIOD OF 1898-9.

Running Expenses, Fish Market	$ 1,000.00

Respectfully submitted,

ANDREW BROWN,
Clerk of Market.

REPORT

OF THE

ROAD SUPERVISOR,

HONOLULU.

Honolulu, December 31, 1897.

JAS. A. KING, ESQ., MINISTER OF INTERIOR:

SIR:—I beg to submit herewith my Report of Work done on the Honolulu Roads for the two years ending December 31, 1897.

The statement shows in detail the amounts expended on each street or road for construction, repairs, culverts and bridge work. Appended to this is a statment of the purchase and repairs of crushing and rolling machinery, live stock, wagons, carts and implements required for road work.

Statement showing Expeditures by Bureau of Honolulu Roads for (2) two years ending December 31, 1897. Distributed as follows:

	Labor.	Material.	Total.
Allen Street.			
Construction	$ 365.71	$ 241.46	
Culverts	85.30	90.50	
Repairs	1,182.71	14.11	$ 1,979.79
Alakea Street.			
Crossings	$ 58.98	19.75	
Curbing	.27		
Repairs	162.72	2.37	
Sidewalk	1.04		245.13
Alapai Street.			
Construction	$ 139.31		
Repairs	509.33	5.50	654.14
Asylum Road.			
Repairs	$ 49.74	10.30	60.04
Aala Street.			
Repairs	$ 73.22	.10	73.32
Artesian Street.			
Weeding	$ 9.01		9.01
Adams Lane.			
Repairs	$ 1.56		1.56
Achi Lane.			
Repairs	$ 3.88		3.88

	Labor.	Material.	Total.
Beach Road.			
Construction	$	152.50	
Fence		3.79	
Repairs	9.27		165.56
Beretania Street.			
Construction	$ 35.67		
Culverts	350.97	337.29	
Repairs	250.08	4.99	
Weeding	12.17		991.17
Bethel Street.			
Repairs	$ 12.92		12.92
Bishop's Lane.			
Repairs	$ 2.31		2.31
Beckley Street.			
Repairs	$ 52.72	6.40	59.12
Bingham Street.			
Weeding	$ 15.45		15.45
Bates Street.			
Repairs	$ 1.47		1.47
Custom House Yard.			
Repairs	$ 1.04		1.04
Chaplain Lane.			
Repairs	$ 1.58		1.58

	Labor.	Material.	Total.
Diamond Head Road.			
Bridge	$ 66.42	217.39	
Construction	365.13		
Culverts	38.00	128.52	
Repairs	242.18		1,057.64
Dole Road.			
Weeding	$ 7.89		7.89
Emma Street.			
Culverts	$ 40.06	26.80	
Repairs	38.41		
Sidewalk	1.10		106.37
Executive Building Ground.			
Repairs	$ 4.62		4.62
Esplanade Lot.			
Dump	$ 471.02	17.50	
Repairs	44.14		532.66
Fort Street.			
Crossings	$ 78.38	198.45	
Dumping	70.04		
Repairs	260.62	14.23	621.72
Green Street.			
Repairs	$ 73.53		
Weeding	18.69		92.22

	Labor.	Material.	Total.
Hackfeld Street.			
Quarry	$ 1,241.86		
Repairs	124.79		
Weeding	30.56		1,397.21
Hotel Street.			
Construction	$ 24.21		
Dump	7.42		
Repairs	202.78	1.06	235.47
Hobron Lane, Nuuanu.			
Repairs	$ 26.35		26.35
Hobron Lane, Waikiki.			
Bridge	$ 1.25		
Construction	955.11	347.38	
Repairs	117.36	38	1,421.48
Halekauila Street.			
Construction	$ 20.54		
Repairs	3.20		23.74
Hassinger Street.			
Weeding	$ 5.41		5.41
Iwilei Road.			
Bridges	$	23.89	
Dump	47.58		
Repairs	292.71	62.91	427.09

	Labor.	Material.	Total.
Iiwi Street.			
Repairs	$ 2.51		2.51
Judd Street.			
Bridges	$ 7.09	24.05	
Culverts		13.66	
Repairs	1,739.74	55.92	
Weeding	13.50		1,853.96
Kuakini Street.			
Repairs	$ 323.65	10.20	
Culverts	1.25		335.10
Kilauea Street.			
Construction	$ 733.47	157.08	
Repairs	1.92		892.47
Kalihi Road.			
Bridges	$ 7.25	11.34	
Culverts	7.01	27.09	
Quarry	711.51	26.00	
Repairs	1,048.77	36.53	1,875.50
Keaumoku Street.			
Repairs	$ 153.28	5.04	
Weeding	31.94		190.26

	Labor.	Material.	Total.
Kewalo Street.			
Ditch	$ 37.60		
Repairs	148.81		
Weeding	46.65		233.06
Kukui Street.			
Culverts	$ 47.60		
Repairs	17.46	.53	65.59
Kapiolani Street.			
Repairs	$ 188.32	.65	
Weeding	57.38		246.35
Kawaiahao Lane.			
Repairs	$ 14.46		14.46
Kukui Lane.			
Culverts	$	38.56	38.56
Kamehameha Road.			
Bridges	$	20.39	
Culverts	2.70	1.75	
Quarry	1,582.27		
Repairs	835.74	105.20	2,548.05
Kinau Street.			
Crossing	$ 2.45		
Dump	42.85		
Repairs	1,020.85	100.62	
Weeding	4.32		1,171.09

	Labor.	Material.	Total.
King Street.			
Bridges	$ 11.35	498.05	
Crossings	19.36	58.75	
Culverts	280.00	317.83	
Repairs	4,792.86	675.05	
Sidewalk	3.38		
Widening	38.66		
Weeding	57.72		6,753.01
Kamoiliili Road.			
Quarry	$ 16,705.27	3,288.94	
Repairs	25.62	1.90	
Weeding	15.16		20,036.89
Kakaako Road.			
Butts	24.95		
Culverts		11.13	
Repairs	613.11	4.32	653.51
Kaiulani Street.			
Repairs	$ .54		.54
Kapiolani Park Road.			
Repairs	$ 77.84		77.84
Kalihi Road, (west).			
Culverts	$ 7.09	7.48	
Repairs	5.41		19.98

	Labor.	Material.	Total.
Kekaulike Street.			
Construction	$ 210.39		
Repairs	26.68	1.20	238.27
Kalia "Bridges."			
Repairs	$ 20.58	72.53	93.11
Kahauiki Road.			
Bridge	$ 3.08	56.33	
Construction	1.09	.20	
Repairs	$ .40		61.10
Kapahulu Road.			
Repairs	$ 17.94		17.94
Liliha Street.			
Culverts	$ 2.72		
Repairs	712.72	135.55	
Weeding	61.33		912.32
Lunalilo Street.			
Repairs	$ 171.72	16.31	
Weeding	53.42		241.45
Likelike Street.			
Repairs	$ 1.38		1.38
Lower Waikiki Road.			
Bridges	$	12.11	
Repairs	1,017.14	96.72	1,125.97

	Labor.	Material.	Total.
Metcalf Street.			
Repairs	$ 4.32		
Weeding	23.42		27.74
Magazine Street.			
Repairs	$ 79.63		
Weeding	14.64		94.27
Moanalua Street.			
Culverts	$ 33.82	15.63	
Repairs	3,314.98	231.18	3,595.61
Manoa Valley Road.			
Bridge	$	52.90	
Culverts	10.83	18.90	
Repairs	1,111.30	2.67	1,196.60
Makiki Ditch.			
Dump	$ .36		
Ditch	294.50	17.25	
Quarry	1.07		
Repairs	124.82		
Weeding	18.90		456.90
Maunakea Street.			
Repairs	$ 94.17	.70	94.87

	Labor.	Material.	Total.
Merchant Street.			
Crossings	$ 30.87		
Repairs	43.20		
Sidewalk	5.30		79.37
Miller Street.			
Repairs	$ 63.50		63.50
Mililani Street.			
Repairs	$ 226.65	7.50	234.15
McCully Street.			
Weeding	$ 6.54		6.54
Mamo Street.			
Repairs	$ 2.51		2.51
Nuuanu Street.			
Crossings	$ 17.37		
Culverts	76.60	88.66	
Dump	8.65		
Repairs	2,015.89	413.38	
Weeding	71.34		2,691.89
Nuuanu Pali Road.			
Bridges	$ 4.10	40.89	
Culverts	4.29	8.83	
Repairs	736.19	6.22	800.52
Nuuanu Stream Ret'g Wall.			
Repairs	$ 434.72	89.00	523.72

	Labor.	Material.	Total.
New Fish Market Road.			
Repairs . . . . . $	5.35	3.85	9.20
Ohia Street.			
Repairs . . . . . $	19.02		19.02
Pensacola Street.			
Construction . . . . . $	216.02	33.80	
Repairs	32.40		
Weeding	92.81		375.03
Piikoi Street.			
Construction . . . . . $	1,524.67	157.07	
Culverts	75.17	163.51	
Repairs	121.02		
Weeding	107.15		2,148.59
Punchbowl Street.			
Culverts . . . . . $	13.42	27.50	
Ditch	242.07		
Quarry	250.09		
Repairs	757.51	248.86	1,539.45
Prospect Street.			
Culverts . . . . . $	11.44	16.99	
Repairs	216.85		
Weeding	6.24		251.52

	Labor.	Material.	Total.
Punahou Street.			
Culverts . . . . . $	.72		
Ditch	47.92		
Dump	19.45	1.10	
Repairs	12.94		
Weeding	12.17		94.30
Pauahi Street.			
Repairs . . . . . $	46.62		46.62
Pauoa Road.			
Bridges . . . . . $	128.54	178.44	
Culverts	1.34		
Fence		5.78	
Repairs	789.07	7.20	1,110.37
Palama Road.			
Culverts . . . . . $		4.85	4.85
Punchbowl Drive.			
Repairs . . . . . $	201.61		201.61
Papakea Road.			
Bridge . . . . . $	2.71	12.06	14.77
Quinn Lane . . . . . $	20.22		20.22
Queen Street.			
Crossing . . . . . $	6.79		
Construction	274.62.	15.52	
Culverts	12.41	42.50	
Extension	19.39		
Repairs	1,050.22	154.34	
Sidewalk	22.26		1,598.05

	Labor.	Material.	Total.
Richards Street.			
Construction . . . . . $	29.23		
Repairs	941.37	220.56	1,191.16
Receiving Station R'd.			
Repairs . . . . . $	50.45	2.60	
Weeding	24.40		77.45
River Street.			
Construction . . . . . $	94.38		94.38
Robinson Lane.			
Repairs . . . . . $	20.49		20.49
Smith Street.			
Repairs . . . . . $	47.69	1.70	49.39
South Street.			
Dump . . . . . $	224.89	6.60	
Repairs	14.11		245.60
Spencer Avenue.			
Repairs . . . . . $	33.35	2.00	
Weeding	4.32		39.67
School Street.			
Bridges . . . . . $	57.99	40.26	
Repairs	52.80	.25	151.30

	Labor.	Material.	Total.
Stable Yard Road.			
Fence . . . . . $		2.49	
Repairs	375.38	61.32	439.19
Sheridan Street.			
Bridges . . . . . $	7.09	23.30	
Repairs	69.26		99.65
St. Louis College Lane.			
Repairs . . . . . $	19.64	7.10	26.74
Thurston Avenue.			
Repairs . . . . . $	1,849.13	88.26	1,937.39
Tantalus Road.			
Culverts . . . . . $		15.12	
Repairs	750.27		765.39
Thomas' Square.			
Repairs . . . . . $	6.53		6.53
Union Street.			
Repairs . . . . . $	11.64		11.64
Ululani Street.			
Repairs . . . . . $	35.23		35.23
Vineyard Street.			
Bridge . . . . . $	14.95	12.40	
Construction	1,461.50	586.47	

	Labor.	Material.	Total.
Vineyard Street.			
Culverts	11.51		
Dump	2.09		
Repairs	30.16		2,119.08
Victoria Street.			
Dump . . . . . $	5.30		
Repairs	72.25	6.03	83.58
Waialae Road.			
Bridges . . . . . $	14.81	75.94	
Culverts		2.06	
Repairs	4,036.08	19.23	4,148.12
Waikiki Road.			
Bridges . . . . . $	13.14	76.95	
Repairs	657.58	15.49	
Weeding	43.91		807.07
Wilder Avenue.			
Repairs . . . . . $	225.67	23.67	
Weeding	48.07		297.41
Wyllie Street.			
Repairs . . . . . $	27.06		
Weeding	20.93		47.99
Ward Street.			
Ditch . . . . . $	26.43		26.43

	Labor.	Material.	Total.
Young Street.			
Repairs	$ 144.25	5.04	
Weeding	55.33		204.62
Total of "Street Account"			$ 80,164.92

	Labor.	Material.	
Total Street Account . . .	$ 68.986.42	11.178.50	
Total Sundry Account . .	13,652.67	32,846.41	
Grand Total	$ 82,639.09	$ 44,024.91	$126,664.00

RECAPITULATION.

	Labor.	Material.	Total.
Bridges	$ 339.77	1,376.69	1,716.46
Butts	24.95		24.95
Construction	6,451.05	1,691.48	8,142.53
Culverts	1,114.25	1,405.16	2,519.41
Crossings	214.20	276.95	491.15
Curbing	.27		.27
Dumps	1,141.72	25.20	1,166.92
Ditches	406.45	17.25	423.70
Extension	19.39		19.39
Fences		12.06	12.06
Nuuanu Retain'g Wall.	434.72	89.00	523.72
Quarries	20,492.07	3,314.94	23,807.01
Repairs	37,285.07	2,969.77	40,254.84
Weeding	1,029.43		1,029.43
Sidewalk	33.08		33.08
Total	$ 68,986.42	$ 11,178.50	$ 80,164.92

SUNDRY ACCOUNT.

	Labor.	Material.	Total.
Cleaning Streets	$ 5,804.67		$ 5,804.67
Crusher Engine.			
Repairs	$ 99.66	292.50	
Fuel		103.32	
Oil		24.37	519.85
Cars.			
Repairs	$	731.90	
New		445.12	1,177.02
Harness.			
Repairs	$ 742.95	660.03	
New		278.50	1,681.48
Horse Roller.			
Repairs	$	48.54	48.54
Horse and Mule Accounts.			
Feed	$	14,064.56	
Shoeing		1,815.87	
Medicine		138.11	16,018.54
Live Stock Mule purchase		860.00	860.00
Office Expense, "Advert. and Stationery" ...		589.22	589.22
Powder and Fuse		1,739.04	1,739.04

	Labor.	Material.	Total.
Steam Roller.			
Repairs . . . . . $	767.51	270.17	
Fuel		1,541.58	
Oil		309.62	
Waste		43.14	2,932.02
Shops.			
Repairs . . . . . $	625.31	67.95	693.26
Stable Yard . . . . . $	3,808.40	225.79	4,034.19
Sprinkling Streets	1,804.17	408.03	2,212.20
Tools and Implements.			
Repairs . . . . . $		1,857.46	
New		1,267.71	3,125.17
Wagons and Carts.			
Repairs . . . . . $		3,300.96	
New		1,706.97	
Lubricator		55.95	5,063.88
Total of Sundry account "Labor" and "Material"			$ 46,499.08
" " " "	$ 13,652.67	$ 32,846.41	
" " Street "	68,986.42	$ 11,178.50	80,164.92
Grand Total . . . . $	82,639.09	$ 44,024.91	$126.664.00

W. H. CUMMINGS,
Road Supervisor, Honolulu.

REPORT

OF THE

REGISTRAR OF CONVEYANCES.

BUREAU OF CONVEYANCES.

HONOLULU, H. I., December 31, 1897.

JAS. A. KING, ESQ., MINISTER OF INTERIOR:

SIR:—In the report of this bureau for the past year, as required by law, I find little if anything to present that varies it from that of 1896, except that it has been a year of steadier, crowded work for which the limited number of copying clerks of this office has been inadequate. Without too seriously taxing the patience of the public, the work has been accomplished at the personal expense and sacrifice of present incumbents, as shown in my former report, but with a more regular, recognized necessity, as may be judged by the accompanying table which shows its steady increase. And this monetary evidence is but a moiety of the growth of work, its natural accompaniment being a livelier searching of records by professionals and the general public that, day

after day, at times, have required so much waiting upon as to demand more than one clerk's attendance.

In view of this fact I make requisition for another copyist to add to the regular staff, and request furthermore, that provision be made for the engagement of extra help in the busier months of the year, if required, should the coming period exceed the estimated activity, as did the past. A similiar request was embodied in my last biennial report, but was apparently not deemed of sufficient importance to consider, notwithstanding the fact that the closing work on reindexing the records would deprive the office of help from that quarter, in emergencies, as heretofore. The experiences of the period just closed has so fully illustrated the justness of the provision asked, that the liberty is taken to again show its necessity.

The cash receipts of this bureau for the last biennial period amounts to $24,865.50, a gain of $6,865.50 upon the estimate of $18,000, based upon the work of the preceeding period, which reached the sum of $17,573.25.

As illustrating the steady increase in the work and revenue of the office, the following comparative table for the past four years may be allowed to speak for itself:

Receipts of Registry Office for the years 1894, 5, 6 and 7.

SOURCE OF RECEIPTS.	1894	1895	1896	1897
Recording fees.	$ 7,416 50	$ 8,651 50	$ 10,766 50	$ 12,882 00
Search fees...	67 75	80 50	14 00	.....
Copies miscel. insts	297 00	411 00	328 00	189 00
Acknowledgments.....	27 00	26 00	24 00	24 00
Copies R. P. or L. C. A.....	399 50	196 50	345 00	293 00
Total.....	$ 8,207 75	$ 9,365 50	$ 11,477 50	$ 13,388 00

Judging from the present indications and experiences of the past, the estimated revenue of this bureau for the coming period is placed at $24,000, and its expenditures at $15,270, for the following provisions, viz.:

Salaries—Registrar and Deputy.....	$ 8,000
Pay of copyists.....	6,720
Incidentals	550
Total	$ 15,270

This sum exceeds slightly the amount appropriated for the last period. The increase for incidentals anticipates an extra number of records required in the next two years, and the need of a new set of indices for current work before the period closes.

The recent addition of a type-writing machine it is hoped will prove a convenience in saving valuable time on orders for Certified Copies of Instruments, especially where a number may be required for a case in Court, several of which are in one book as was the first order bringing it into use.

A recent criticism that the office was cramped for the important public service required of it is an apparent condition we frequently labor under, from the fact that the majority of searchers continually ignore the rule to replace all indexes when through with. This not only works against their own convenience; but multiplies the wear thereof and presents the untidy, crowded appearance complained of, which additional space would not remedy. For the proper care and preservation of the books of the office it is becoming a serious question as to whether the privileges of search should not be denied all who thus fail to appreciate necessary care for their preservation, as is done in other places.

A Searcher's Annual license fee would meet the expense of wear but with some it might be viewed as a license to do further damage. As a rule it is not the occasional searcher that is to blame, but those whom familiarity with the work has seemingly bred contempt. The wear and strain on the records of this, as also of the Land Office, is very severe, and makes us naturally solicitous for their proper care and preservation.

Respectfully submitted,

THOS. G. THRUM,
Registrar of Conveyances.

REPORT

OF THE

COMMISSIONER OF AGRICULTURE.

December 31, 1897.

J. A. KING, ESQ., MINISTER OF THE INTERIOR AND PRESIDENT OF THE BUREAU OF AGRICULTURE AND FORESTRY.

SIR:—I have the honor of presenting the following report for the operations of the Bureau of Agriculture and Forestry for the biennial period ending December 31, 1897.

GOVERNMENT NURSERY.

During the two years ending December 31, 1897, there has been distributed from the Government Nursery on King street 31,705 plants as follows:

1896.		1897.	
January.....	1,472	January.....	1,956
February.....	618	February.....	785
March.....	660	March.....	1,174
April.....	848	April.....	978

May	450	May	2,778
June	526	June	1,324
August	143	July	1,376
September	2,148	August	1,486
October	1979	September	2,322
November	974	October	2,560
December	1,806	November	2,146
		December	1,196
Total	11,624	Total	20,081

The above number of plants were distributed free to the Public, and in addition 9465 plants were sent to the New Station.in upper Nuuanu Valley.

The plants distributed comprises over 50 varieties as follows:

FRUITS.

Papaia	Carica Paypaya
Advocado Pears	Persea gratissima
Mango	Mangifera indica
Sour Sop	Anona Muricata
Custard Apple	A-reticulata
Rose Apple	Eugenia Malaccensis
Tahiti Vi	Spondias Dulcis
Tamarind	Tamarindus indica
Lemon	Citrus Limonium
Lime	Citrus Limetta
Orange	Citrus Aurantium
Pomegranate	Punica Granatum
Java Plum	Eugenia Jambolana

Jack Fruit.....Autocarpus integrifolia
Strawberry Guava.....Pridium Cattleyanum
White or Yellow Guava.....Pridium acidum
Zapote.....Casimiroa edulis
Granadilla.....Passiflora alata
Mammee.....Mammea Americana
Coffee.....Coffea Arabica
Liberian Coffee.....Coffea Liberica

PALMS.

Latania Barbornica
Livistonia Rotundifolia
Ptychosperma Alexandra
Seaforthia Elegans
Pritchardia Martii.....Native Loulu
Pritchardia Gaudichundii.....Native Loulu
Oreodoxa Regia.....Royal Palm
Phoenix Dactylifera
Thrinax Argentia
Sabal Blackburnia
Areca Rubia
Areca Alba
Brahea Filamentosa
Areca Catechu
Elaeis Guineensis.....Oil Palm
Caryota Urens.....Wine Palm
Arenga Sacharifera.....Sugar Palm
Cherimoyer, Anona cherimolia

TIMBER, SHADE AND ORNAMENTAL.

Eucalyptus.....Several species
Grevillia Robusta.....Silk Oak

Casuarina.....Several species
Prosopis Dulcis.....Kiawe or Algaroba
Alamanda
Acacia Decurrens.....Black Wattle
Acacia Koa
Araucaria Bidwillii
Fraxinus, Species.....Mexican Ash
Bignonia
Bauhinia.....Species
Crotons.....In variety
Cassia.....Species
Crescentia cucurbitina...Calabash tree
Carthatocarpus.....Golden shower
Jacaranda
Thesphesia Populnea.....Milo native
Schinus Molle.....Pepper tree
Phyllanthus
Taxadium Mexicanum
Semele.....Species
Cedrela.....Species
Janicuil

On January 1st there was on hand and ready for distribution 19,000 plants, in addition to the above, there are many thousands of small plants in the propagating boxes, which will in due course be ready for distribution.

For some time past certain individuals have expressed the opinion, that the Government Nursery should be discontinued, and the work of introducing, propagating and distributing new economic and ornamental plants be left to private enterprise. To adopt any such course would, in the opinion of the writer, be a serious mistake, no city

in the world can show such a luxuriant and varied wealth of vegetation as can Honolulu, and this has been brought about by the establishment of the Government Nursery, from which it is safe to say, at least 95 per cent. of the beautiful plants growing in the gardens of Honolulu, have been obtained free of cost. It is true that a great many people could afford to pay for plants, but there are thousands of others who could not afford to do so, and were the Government Nursery closed they would be without the means of beautifying their Homes. Honolulu is growing fast and the demands on the Nursery is constantly increasing. During the five years previous to the formation of the Bureau of Agriculture and Forestry in March, 1893, the distribution of plants by the Government averaged about 5000 per annum, since that time it has steadily risen and now over 20,000 plants per annum are given away by the Government to the taxpayers free of cost.

The cost of maintaining the Nursery is but $1,565.00 per annum for superintendent and labor, and about $200.00 for incidentals, for this small outlay per annum, Honolulu has been made into a beautiful Botanic garden, the admiration of all visitors and an attraction to all the world.

NEW FORESTRY STATION IN NUUANU VALLEY.

On the 1st of April, 1897, the Forester and laborers were transferred from the old Makiki Station, to a new station in upper Nuuanu Valley, for the purpose of reforesting the same.

There are five laborers and a superintendent to propagate and plant out trees. During the nine months since the Station was started the five men employed have propagated and planted out the following number and variety of trees:

Java Plum.....	Eugenia Jambolana .	9,000
Albizzia lophantha		3,250
Silk Oak.....	Grevillia Robusta ...	750
Black Wattle.....	Acacia Decurrens ...	3,000
Silver Wattle.....	Acacia Dealbata	500
Acacia Koa.....	Native	10,000
Sappan Wood.....	Caesalpinia Sappan ..	650
Iron Wood.....	Casuarina Equistifolia	50
Various Fruit trees and shrubs.....		300
		27,500

TREES IN BOXES.

Acacia Albizzia lophantha.....	150
Acacia Decurrens	4,000
Acacia Dealbata	1,000
Acacia Koa	6,000
Casuarina quadrivalvis	2,000
Casuarina Glauca	2,000
Eucalyptus Marginata	3,000
Eugenia Jambolana	1,500
	19,650

The whole of the land in Nuuanu Valley set apart by the Government for a Water shed, is with the exception

of the steep mountain slopes, denuded of the Forest that in all probability covered the lands in former times.

The importance of reforesting the whole upper Valley, with the view of conserving and regulating the water supply, can hardily be overestimated. The winter rains falling on the open lands are not retained, but pass off quickly, the streams rising and falling with great rapidity. When the whole upper Valley shall be covered with a forest, a different state of things will exist, the rains will not drain off so quickly, but will be carried by the roots of the trees deep into the soil, which in forested lands forms an immense natural sponge which allows the water to drain off gradually, not only maintaining a constant and regular flow in the streams, but purifying the water in its course through the soil. At present the bulk of the water, draining or passing over the surface of the soil, carries many impurities with it which pass in to the reservoirs and render the water unfit for domestic use.

With the small force at present employed, the work of planting trees, on the large area of land requiring to be reforested, will take years. The work should be pushed with the utmost vigor, and I would earnestly recommend that the force at the Nuuanu Station be increased to at least 25 men, 50 would be better, and the work can be completed in a comparatively short period.

DISTRIBUTION OF SEEDS.

The work of distributing seeds of such economic trees and plants as are adapted to the soil and climate of this country, has been continued, and it is cheering to note

the increasing interest taken by both sugar and coffee planters in tree planting. In several districts the need of wind breaks for the coffee trees is strongly felt, and your Commissioner has supplied free of cost to all persons applying for them, seeds of such trees as have proven to be adapted for the purpose of shade, and protection for the coffee trees.

With all seeds distributed, a printed circular is sent containing explicit instructions, how to propagate and care for the young trees.

FORESTRY.

The importance of Government action in the matter of Forest protection has been treated on in former reports by your Commissioner, and also by very able reports by committees of the Sugar Planters' Association, but up to the present time, with the exception of several plantations who wisely are protecting and replanting their denuded forest lands, no general scheme of Forest protection has been adopted. It is cheering to note however that something is likely to be done in this vital question before long. The employment of an expert in Climatology and Forestry to come to this country and advise us in the matter of Forest protection, is a wise course and it is to be hoped that the services of such an expert can be obtained without delay, so that provisions can be made by the coming Legislature to enable the Government to carry out such schemes of conservation and reforesting, as may be decided upon by those qualified to pass upon such a vital question.

EXPERIMENTAL STATION.

The need of an Experimental Station in Honolulu is greatly felt. New industries to occupy lands unsuitable for coffee, sugar and rice would prove of the utmost value to the country. Petite cultures to go hand in hand with the coffee industry, and which will enable the Planters to profitably employ all the year round, a sufficient number of laborers so that when the picking season is on, he will have at his command, enough hands to gather the crop without loss.

During the past year a superior quality of Castor Oil Beans were sent to every Coffee planter in Olaa and Puna Districts, with the hope, that not only would this plant prove valuable as a shade for young Coffee trees, but also prove a profitable crop to grow for the oil, which is a staple article in the markets of the world. Once prove that Castor Oil is a paying crop, and many would at once engage in its culture, but until that fact is demonstrated, no one will pay serious attention to it.

Another industry that is full of promise, is the growing of Sea Island Cotton, for some years past persons have now and then planted a patch of cotton, with the only result of proving what was known years ago, viz:, that the plants find a congenial home in this country, what is wanted, is the knowledge of whether or not, cotton, or any other economic plant, can be cultivated with profit, with the kind and price of labor obtainable in these Islands. Private individuals seldom have the means or inclination to carry on any Experimental Cultivation to a complete conclusion and preserve all the data that

would serve as a guide to others. It is possible that many economic plants may eventually be made profitable to cultivate, and thereby diversify our products, but much careful experimenting will have to be done to determine the best methods and cost of cultivation, before recommending such plants for economic culture in this country.

All such experimental work should be done by the Government, all that is needed is the funds to carry on the work. The Bureau of Agriculture is in possession of a suitable tract of land for an Experimental Station, and although the amounts needed to start the work have been voted, first by the Provisional Government, and afterwards by the Legislature, unfortunately the items were placed in the list of moneys to be paid out of current receipts, and have not up to the present time been available. An estimate of the cost of starting the Experimental Station and carrying it on for the ensuing biennial period, has been prepared, and I would ask that the same be presented to the Legislature, with the recommendation that it pass.

As in former reports, your Commissioner would again strongly recommend the moving of the Reformatory School to the site of the proposed Experimental Station, there the boys could be employed and taught how to cultivate the soil. With the hours of the day properly apportioned to School and work in the Station, the boys would learn habits of steady industry, and when allowed to leave the school, they would be in a position to earn their own living in the Agricultural districts, and not drift into the already overcrowded ranks of the unemployed in Honolulu.

BLIGHTS AND INSECT PESTS.

During the past four years there has been a great diminution in the blights and insect pests that formerly were such a menace to our agriculture. The work of Professor Koebele has been of immense benefit to the country, but his work is by no means finished, it is safe to say that as long as agriculture is carried on in this country, the services of an entomologist will be needed in a country like this, where the conditions for the multiplication of insect life are so favorable, there will always be danger from the introduction of some new blight or insect pest. The most careful and complete examination of plants coming into this country, is not a complete safeguard, there are so many other ways, other than in soil and on plants that insects may be introduced, in and on fruits, in bagging, hay, straw and by many other means, a bad blight or insect may be introduced and gain a foothold before it is discovered. Some two years since a small louse appeared on the cane fields in Kauai, its effects were such as to threaten the destruction of the cane. Happily Professor Koebele sent a lady bird that made short work of the louse, and it is no longer feared.

The Hawaiian Sugar Planters' Association have shown their appreciation of Professor Koebele's services, and also their desire to retain him to the service of this country, by voting an increase in the salary paid by them. Professor Koebele has been receiving a salary of $3,000 per year and traveling expenses, one-half being paid by the Government and one-half by the Planters' Association. At the October meeting, the Hawaiian Sugar Planters voted to pay Professor Koebele an increase of $500

for the year 1898, making the part of the salary paid by them $2,000 and $500 for his incidentals and traveling expenses.

I would recommend that the Government insert in the Appropriation Bill a sum equal to that appropriated by the Hawaiian Sugar Planters' Association, as the pay of Professor Koebele.

COFFEE.

The most cheering reports have come to hand from all the coffee districts concerning this promising industry, ever since the opening up of the Olaa District, doubts have been expressed by many people, as to the suitability of the Olaa District for the profitable production of coffee. The fertility of the soil was admitted, but the large rainfall of that region was cited as a reason why the coffee trees would not bear an average crop, but would produce a superabundance of wood and not bear fruit. These doubts have been set at rest, the coffee trees in Olaa that have reached the bearing age, are yielding as good a crop as any trees growing in the most favored Districts, and provided that nothing occurs to diminish the supply or increase the price of labor, the coffee industry seems to be assured of success. It is true that many mistakes as to the planting and culture of the coffee trees have been made, but this is always the case at the beginning of a new industry; time and experience will lead to a better understanding of the conditions under which the coffee tree must be cultivated in this country in order to obtain the best results. The conditions in Olaa and Kona are very different, and the system of handling and pruning

in one District would not answer in the other. It would be a wise policy on the part of the Government to employ a coffee expert, who would familiarize himself with the conditions prevailing in the different Districts, and devote his time to visiting the coffee planters and advising them as to the best methods of planting and caring for their trees.

The advice of such an expert would be particularly valuable to the new beginners, who come here to engage in coffee culture, and who, with very rare exceptions, have not had the slightest previous knowledge or experience in the culture of coffee. While much can be learned by the intelligent perusal of books on the cultivation of coffee, it is not wise to rely altogether on the information contained in books, they may be very accurate as to the methods of cultivation of coffee in the countries where they were written, but the conditions vary so much in the great coffee countries that the methods obtaining in one, could not be applied to another with complete success. Practical object lesson by an expert, will teach more than all the coffee books, and such an expert is very much needed at the present time, there are scores of small growers throughout the Islands who lack even the elementary knowledge of how to prune their coffee trees, and they must be shown how or they will not do it, or will do more harm than good if they attempt it. We have in this country several experts on the cultivation and pruning of coffee trees, and in several instances where they have been engaged to prune neglected coffee trees, the result has been marked by a largely increased crop of berries. It is no exaggeration to say, that were

all the coffee trees in the Kona District properly pruned, the next crop would be more than trebled.

I would recommend that an item be inserted in the Appropriation Bill to cover the salary and traveling expenses of a coffee expert under the control of the Bureau of Agriculture and Forestry.

The labor supply for the coffee plantations is a problem that demands attention, it is all very well as long as the sugar planters keep on importing laborers, and the time expired laborers and deserters go to the coffee plantations, but this may cease some day, and the sugar planters and the coffee planters will be competitors for the labor in the country, and when this does occur, it will cause a rise in the price of labor beyond the powers of the coffee planters to pay and carry on his enterprise with profit. As regards the labor supply, this country is standing on the edge of a volcano, at any time the supply may be cut off, a war in the East would not only cut off the supply, but might draw laborers from this country.

Annexation, followed by legislation adverse to the introduction of laborers from the East, would at once cut off our supply of labor from that source, and a serious check to our prosperity would ensue. While such a thing may not occur, it would be a wise plan to prepare for any such eventuality, and put our labor supply on a safe basis, this can never be done by the introduction of so many unmarried men, who only come here for two or three years and then return to their own country, necessitating the yearly introduction of thousands of male laborers, if instead of only 25 per cent. of women being brought with the men, an equal number of the sexes were

brought, there would not be anything like the numbers of laborers yearly returning to their own country. A married man cannot travel so easily as one that is single, and morever, a married man is more likely to settle down and become a permanent resident, especially in a country like this, where the conditions of life are easier than in his own country.

From whatever source laborers are brought a woman should accompany every man, and it would be a wise course for the Legislature to pass a law making this imperative.

FIBER PLANTS.

The importation by this bureau of over 70,000 plants of the Agave Sisalana some four years ago, is now about to bear fruit, the plants have done so well and multiplied to such an extent, that a company is organizing to engage in the cultivation of sisal hemp on a large scale, there is probably no plant known, that offers such an opportunity for the utilization of our dry leeward lands, upon which no water can be brought, as the Agave Sisalana. Upon the rockiest and most barren soils, the plant will grow and flourish, it is true the returns per acre are not large, say $50 per acre, but this return can be obtained at an outlay of not over $20 per acre, after the plants have reached the stage when the leaves can be cut for fibre.

The Agave Sisalana is not the plant for the small cultivator, machinery driven by steam is necessary in order to extract the fibre contained in the leaves, and in order

to warrant the purchase of such machinery, the cultivation must be entered upon on a large scale.

In a few years from now many of the plants set out four years ago, will pole and bear thousands of young plants which will be available for setting out new plantations. The plant multiplies itself in two ways, by sending out suckers or young plants from around the roots, and by poling, at seven or eight years of age, provided the leaves have not been cut off each year, the plant sends up a long stalk or pole from the center, this pole sends out numerous branches upon which are borne thousands of little bulbs, which in a short time fall off, these are planted in a nursery and when a foot high, are transplanted to the fields.

At four years of age the cutting of the leaves for fibre can be commenced and continued for 15 years, each plant yielding about 40 leaves per annum.

The area of dry rocky lands on the Hawaiian Islands is very large, at present these lands yield nothing of value, they can all be put to profitable use by means of the sisal plant.

EXPENDITURES.

	Appropriation.	Expended.	Balance.
Pay of Commissioner	$ 4,200 00	$ 3,500 00	$ 700 00
" " Prof. Koebele	5,000 00	3,619 17	1,380 83
" " Gardener Nursery ..	2.040 00	2,040 00	.....
" " Forester Makiki.....	1,800 00	1,576 00	224 00
" " Laborers "	1,800 00	1,786 07	13 93
" " " Nursery	1,080 00	1,078 36	1 64
Forest & Nurseries	12,347 00	3.274 36	9,072 64

ESTIMATED EXPENSES FOR THE ENSUING BIENNIAL PERIOD.

Salary of Commissioner	$ 4,200.00
One-half salary Professor Koebele	4,000.00
One-half expenses and freight Professor Koebele	1,000.00
Salary of gardener	2,040.00
Salary of forester, Makiki and Nuuanu	2,040.00
Pay of 30 laborers	5,400.00
Materials, supplies, fencing, etc	1,500.00
Importation of plants, seeds, etc	1,500.00
Traveling expenses	250.00
Stationery, stamps, books and periodicals	200.00
Advertising, printing, etc	150.00
Telephone	60.00
Laborers quarters at Nuuanu	500.00
Buildings for gardener and laborers at Experimental Station	1,600.00
Cost of removing large building to Experimental Station	300.00
Glass propagating house at Experimental Station	300.00
Cost of one-half mile 4-in. pipe and laying same	1,400.00
Half-mile 2-in. pipe	528.00
One mile ¾ pipe	316.00
Sixty 2-in. tees with reducers	30.00
120 ¾ in. elbows	15.00
Sixty hose bibs	60.00
Hose and sundry fittings	200.00
Cost of laying and fitting branch pipe	150.00
Two mules	300.00

Cart, ploughs, cultivators and harness.....	350.00
Feed, shoeing, etc.....	450.00
	$ 28,839.00

Respectfully submitted,

J. MARSDEN,
Commissioner of Agriculture and Forestry.

REPORT OF THE ENTOMOLOGIST

OF THE

HAWAIIAN GOVERNMENT.

HONOLULU, December 31, 1897.

JAS. A. KING, ESQ., MINISTER OF INTERIOR:

SIR:—I have the honor to submit herewith my report for the two years ending December 31, 1897.

As you are well aware my first and chief work had to be directed against the numerous scale insects at the time infesting and destroying many of the valuable fruit, ornamental and shade trees. Up to the present time, some sixty species of these have been found on the Islands, and some of them would have made it utterly impossible to raise the citrus and coffee trees successfully, in fact, most of the shrubs and trees at the time were so infested by the then recently introduced and most pernicious coccids ever met with, Dactylopius vastator, Mask, that their destruction in the near future seemed imminent had not relief been brought. Without doubt their destructive work would have spread over all the Islands, notwithstanding the most diligent prevention on your

part. The scale has not been met with as yet in any of the other Islands, and at present wherever it may appear, its enemies are awaiting it, the chief of which no doubt is the Australian Lady bird, Cryptolaemus montrouzieri, Mulsant. The coccid is a native of China where it had been met with in the neighborhood of Hong Kong.

Another numerous scale, and one that had longer been introduced than the previous species, Dactylopius, ceriferus, Newstead, had always been seen covering the leguminous trees often to such an extent that many of them lost their entire leaves and in some instances even were destroyed entirely by the quantities of Mealy bugs present. This species also is kept in check by the Cryptolaemus beetles, which increase to such an extent in the early summer that millions of their larvae can frequently be seen crawling around where the coccids abound. Often this very beneficial insect, for it is always in larval state where they do the most execution, are taken for so-called blights and are in consequence destroyed. It should always be borne in mind that the scale insects or blight are generally stationary, *i. e.*, fixed to the branches and twigs of plants, very rarely move about, and then only very slow; the Cryptolaemus larvae on the contrary is quite active, and when full grown is about a quarter of an inch in length, covered above with six rows of contiguous elongated white mealy secreted appendages. It is then that they can be seen in such numbers that often the fences and walls are covered, the trunks and limbs of trees bear patches of the pupae, often several feet in length. The insect was met with in tropical Australia,

New Caledonia, Fiji, Ceylon and Southern China, and will apparently live out of doors in the tropics only.

Another Dactylopius has occasioned great inconvenience in the cane fields, known as D. chalceolariae, Maskell. Here also the Crypotlaemus beetle appeared, and waged war upon the same with the consequence that at the present time the pest has also practically disappeared. This scale was met with in Fiji and tropical Australia.

Dactylopius adonidum, Linnaeus, has been present upon most all plants. It is this scale that has marred the coffee industry in the Islands ever since the attempt was made to grow the tree over fifty years since, by its large numbers sitting around and sucking out the sap of the young berries, producing a premature coloring and dropping of the same. It likewise lives upon the roots of coffee and many other trees and plants in the tropics all over the world, whilst in colder countries it is found upon greenhouse plants chiefly. The injury to the various vegetation formerly caused by the foregoing and many other species of Dactylopius present on the Islands, is now practically done away with, we have sufficient enemies present for them for all time to come.

Pulvinaria psidii, Maskell, another introduction from the Orient, had spread considerably over the Islands, and caused some anxiety, especially in the coffee districts. I myself must confess that nowhere have I ever seen a landscape so completely blackened by the fungoid growth, caused by the honey exudation of the Pulvinaria scale in which this grows, as that of North Kona on my visit in February, 1894. On my recent trip to the same place, all these had changed, and the district, to me, had

the appearance of another country, all owing to the presence of the Cryptolaemus beetle that devours the eggs of the scale. Since then various other species of lady birds were sent there, and still more will be sent, all of such that will prey both upon the eggs and mature insects.

The rose apple, Eugenia malaccensis was still found covered by the black fungus. Here another tropical scale, Lecanium acuminatum, Signoret, is present in large numbers upon which the Cryptolaemus beetle will not feed, yet many other lady birds have been sent that will feed on this and all species of Lecanium. The above scales have so far been the most numerous and destructive, yet other forms as well have been on the increase and I can give a short account of some of them only, as many of the species are not yet worked up.

Aspidiotus aurantii, Maskell, is injurious to citrus trees chiefly in temperate zones and may have come upon those trees from any port in California, Australia, China, or Japan. It was found upon recently introduced Potocarpus plants from Japan. The climate of Honolulu appears not to be suitable for the same as it was not met with in the tropics as injurious to citrus plants. At Sydney it was found upon Perea carolinensis, Laurus nobilis; Brisbane, numerous upon Jasminum; at Rockhamsden on wild fig tree; Cairns, cultivated figs and Morus sp. In Ceylon on Agave (Green); Hong Kong on Paliurus ramosissimus; Litsea sebifera, Hedyotis acutangulus, (very numerous) Stillingia sebifera; on Melia azedarach at Amoy, Swatow, Hong Kong, Formosa and Honolulu; Japan on Potocarpus and Damara like trees, also many other plants. One Chalcid parasite Aspidiaphagus cit-

rinus, Craw, is preying on the same in China, Japan and California.

Aspidotus cydoniae, Comstock, was found on a garden plant at Paia, Maui, and upon Ake at Honolulu.

Aspidiotus longsipina, Morgan, infests trunks and branches of Orange, Lemon, Mango, Kukui tree, Figs, Pride of India, etc., on all the Islands and even a common weed at Lihue, Kauai. The scale was found at Tamsui, Formosa, on Orange and upon Fig trees at Hong Kong. A large number of the scales are punctured with holes from where a minute Chalcid parasite has issued that keeps the scales in the Islands in check.

Aspidiotus duplex has been repeatedly introduced on Camellia from Japan where it also is found upon the tea and other plants it has as yet not become injurious on the Islands.

At Makaweli, Kauai, Aspidiotus camelliae and A. nerii were found upon imported American Apple, Pear and Peach trees in such numbers that some of the trees had died. A number of other species of Aspidiotus were met with in the Island, all of them introduced.

Of Parlatoria, P. zizyphi is the most numerous upon Citrus and another tree at Honolulu. P. pergandei is as yet not so numerous. The first was found at Hong Kong and Canton infesting Citrus trees, and the second upon Euonymus at Yokohama and on Camellia at Macao. Mytilaspis citricola, Packard, is the scale at present found so numerous upon Citrus trees at Honolulu, where it had spread within two years. A number of introduced lady birds are preying on the same, and as far as my observations go, I believe that in time they will effectually keep the same in check. The scale also infests Groton and

other plants. It is common most everywhere in the world. It is found in the Kona (Hawaii) district but not numerous. Mytilaspis gloverii, Packard, has at present only been met within a Citrus tree in Mr. Jordan's yard. The tree had been imported from Japan or China where the coccid is numerous, and with the foregoing one of the most destructive to Citrus plants.

Mytilaspis pallida, Green, has been found upon imported Japanese Potocarpus plants. Mytilaspis flava, Targioni Tozzetti, was met with upon bark of various shade trees at Makaweli, Kauai, and in China upon Pyrus sinensis (Hong Kong). Mytilaspis pomorum, Bouche, the apple bark louse, was also found on imported American plants at Makaweli, Kauai. Diaspis rosae, Sandberg, is the common rose scale and is found all over the world. Diaspis boisduvalii, Signoret, has been found on imported orchids.

Chionaspis biclavis, Comstock, is found over all the Islands on bark of various trees and always badly parasitical. It is not serious in consequence. It may have come from any of the South Sea Islands or Asia. Chionaspis eugeniae, Maskell, is a widely distributed species, it occurs in Australia, Ceylon, China, and Japan and lives upon very many plants. The scale has been doing well with Mr. Jordan, upon imported Japanese Magnolia and Eugenia.

Chionaspis prunicola, Maskell, Diaspis patelliformis, Sasaki, Diaspis amygdali, Tryon, has been found upon imported Japanese plum trees that had died from the effects of the scale which appears to be very injurious in some temperate zones. It is still present upon a Japanese pear tree on same place at Honolulu. In Ceylon it

was found on bark of Aleurites triloba, at Hong Kong, on Rhus sp. Amoy, on peach, on the same tree at Formosa and unknown wild shrub, in Japan always on Pyrus, Prunus and Morus, on Juglans, Elaeagnus, Ribes rubrum, Salix, Sterculia plantanifolia, Fraxinus, Orixa japonica and many other trees and shrubs. While I anticipate no serious trouble from this coccid in the Islands, yet it should not be allowed to get a foothold, and should be stamped out in the beginning.

Fiorinia camelliae, Comstock, was first noticed upon imported Japanese Potocarpus. It is found most anywhere and has been met with in Australia on many plants, in Ceylon on Mistletoe, on Oleander at Amoy, in Formosa on Psidium and Juniper, Japan on Potocarpus macrophylla, Sciadopytis verticillata, Camellia, Euonymus, etc.; on Alligator pears, palms, Camellia, etc., in Honolulu. Aspidiophagus citrinus, Craw, is preying upon the same.

Ceroplastus rubens, Maskell, was found but sparingly in the beginning of '94, yet at the present it may be seen anywhere and upon most any tree in Honolulu, although numerous, it is not very injurious compared to other scales. The insect no doubt was introduced with plants from China as it is quite common around Hong Kong and there lives chiefly upon the various pine trees. In Ceylon it was found upon Jambosa vulgaris. Two species of Chalcid parasites live upon the same in Honolulu, viz: Tomocera Californica, How, and Coccophagus sp. A third species that is preying upon Ceroplastes floridensis, Comstock, in Japan, has been introduced in some eighty specimens of both sexes.

Both Ceroplastes ceriferus, Anderson, and C. floridensis

have, at innumerable times, been brought in on plants from Japan and China, yet none of these appear to be established.

Lecanium acuminatum, Signoret, is present on many plants in the Islands, yet chiefly upon limes and lemon. It is always badly parasiteized in Honolulu by two species of Chalcid flies.

Lecanium filicum, Boisduval; L. Hemisphaericum, Targioni, Tozzetti; Lecanium coffea, Nietner, is found upon very many cultivated and wild plants throughout the Islands, and is preyed upon by internal parasites; it is found common all over the world, chiefly so in the tropics.

Lecanium hesperidum, Linnaeus, is but rarely found on the higher altitudes; it comes from the temperate zones.

Lecanium longulum, Douglas, is one of our commonest species and attacks most any plant on all the Islands. It was this species that caused the smutty appearance of the iron-wood trees in the park before the introduction of the Rhizobius beetle. It is found in the tropics only out of doors.

Lecanium mori, Signoret, is found also upon many plants in the Islands, on various ferns, guava, etc.

Lecanium nigrum, Nietner, the commonest of all scale insects in the Islands, nearly always can be found upon the Hibiscus hedges, Groton, guava, fig trees, etc. It was met with everywhere in the tropics, Fiji, New Caledonia, Queensland, Ceylon, Singapore, Hong Kong and Formosa. In Japan it can not live out of doors, and is found only in green houses.

Lecanium oleae, Bernard, is not found numerous in

tropical countries, it is rarely met with in Honolulu, only in one instance have I seen it numerous upon oleander, on Hawaii.

Lecanium tessellatum, Signoret, another species found here and there, but not numerous as yet, it is more often attacked by internal parasites.

Pulvinaria mameae, Maskell, and an unnamed species in Kona, are perhaps the only well established species aside from P. psidii mentioned above. It had first been found upon Mamea Americana, Linni. during Jan., '94, but since then it was found on many trees in Honolulu, especially mango and fig. No parasite has been observed on the same, yet without doubt the Cryptolaemus larvae and those of the numerous species of Hyperaspis introduced from California and Japan will destroy its eggs. A fourth species of Pulvinaria was found at Honolulu upon newly introduced Potocarpus from Japan, where the insect is rather rare upon many trees, especially the camellia and magnolia.

Planchonia sp., so far but one specimen was found in Honolulu upon Jacaranda mimosifolia, Prosopis dulcis, Oleander, fig trees, etc., and it is preyed upon by an internal Chacid parasite to such an extent that in some instances the scale has disappeared entirely from some trees. Found at Hong Kong, China, upon fig tree and badly parasiteized. Eryococeus araucariae, Maskell, is found on all the Islands upon the various species of Araucaria; it comes from Australasia.

Of Dactylopius we have a great many species in the Islands but yet they are with a few exceptions, not worked up. It is one of the most easily species to introduce, since many of them when full grown will often leave the

plant and secrete themselves most anywhere to deposit their eggs, often on the roots, in any crevice or behind leaves on stem, etc., the most minute examination of plants could not reveal them.

Icerya purchasi, Maskell, is so far the only species present in the Islands. I. Aegyptiaca, Douglas, and I. Seychellarum, Westwood, are found on many plants around Hong Kong and may be brought in at any time. The two lady birds preying on those species in China, viz: Rodolia fumida, Muls. and R. pumila, Weise. were introduced and no doubt are breeding upon I. purchasi which once so numerous, can now only be found after careful search.

The above comprise the principal coccids found in the Islands, very many of them are preyed upon by internal parasites that were brought in with their host. Some of these are doing very beneficial work, often destroying a large percentage of the scales. Only in few instances were scale insects with internal parasites introduced by me, since there is more or less risk in doing so, it was considered the safest way to follow, only to send the numerous predatious insects found preying on the scales and here we have the numerous lady birds, some two hundred species of which had been introduced with more or less success. It seems that those introduced from the tropical countries, or such that are found in similar latitudes to that of the Islands within a few degrees, have succeeded best to establish themselves; especially when the same coccid upon which they fed in their home was at hand, the increase was marvelous.

Aside from the parasites and predacious insects introduced we have established two species of fungoids des-

tructive to all the Lecanidae and these have since spread over most parts of the Islands. A repeated trial with a third Microcera coccophylla, that lives upon the expense of the various Diaspidinae, has as yet not been so successful. Still I am confident of also establishing this very valuable agent to eradicate the scales. It was met with in New South Wales northward to Cairns, Queensland. It is present in Ceylon, China, Formosa and even as far north as southern Japan, chiefly upon the various Aspidiotus and Mytilaspis, coccids that are always abundant where they occur, owing to their hard protective covering, the enemies preying upon the same have not the equal chance as those preying upon other scales.

At the present time, the most pernicious coccids, at least, have practically become harmless and will become still more so with the increase of their various enemies. I anticipate no danger to the vastly increasing coffee culture by scale insects still present, some of these will yet cause a little trouble to the citrus trees, but I am confident to overcome the same in the near future, as has been done in the past, not with artificial means, but with natural enemies, which if once established, are an everlasting benefit to the country where introduced.

Of the introduced Coccinellidae I will give a short account of some of them. To my knowledge, and that of Rev. Blackburn who studied the insects on the islands some twenty years since, only three species of lady birds were present. Those were Coccinella abdominals, Say, an American insect and no doubt, introduced at a very early date, since it has been known to the oldest residents. It feeds upon Lecanidae and Aphids, is not a fast breeder and since the introduction of other forms has become

much less in number. The other two are small Scymnus, S. ocellatus, Sharp, and S. vividus, Sharp, the last at least, has repeatedly been found breeding upon plant lice. Owing to the large quantities of Coccinella repanta on the Islands, none of the California forms that live upon plant lice have been observed as yet, save that one visitor on the dinner table in the club on Nov. 10th, viz: Coccinella Californica, Man., introduced three years since, yet we are safe to say, several species will turn up in time, if properly searched for. Chilochorus bivulnerus, Muls., was brought to the Islands, in 1891, on my trip to Australia and turned over to Mr. A. Jaeger, who liberated the same.

Again large quantities were sent to you during Dec., '94, with all other California forms. The insect was found breeding, both in '94 and during the last summer, yet never numerous. This is one of the most numerous native lady birds in California that feed upon various scale insects, and a higher altitude may be suitable for their increase. Sendings of these as all other forms will be made again to the various parts on the other Islands direct. Hyperaspis were sent to you in several species, all of these feeding upon the various mealy bugs, (Dactylopius), then and still so numerous in Honolulu. You have forwarded one of the beetles to me at Sydney, some ten months later, as breeding in Honolulu. This has been H. undulate, Say., and I personally have not met with it since, owing no doubt to the enormous increase of other forms, and in consequence the scarcity of its food.

Large numbers of Scymnus were also forwarded to you, and strange to say one of the very rarest California

species, S. debilis. Lec., that had not been found again ever since being described over forty years ago, was met with in quantities while collecting Rhizobius upon Casuarina. The little beetle in California breeds upon Dactylopius, and very likely on the same in the Islands, D. calceolaria, Maskell, on the sugar cane would be similar to that on grass in California.

Of the Australian forms we certainly have the most beneficial of all the lady birds introduced. Of the Aphis feeding species, Coccinella repanta, Thumb., has done wonders in destroying all the various forms of lice on trees, shrubs and plants. It appears usually first upon the orange plant louse; it has practically cleaned out the taro louse, and with it has cured the formerly so prevalent disease upon these plants, which decayed to a large extent in consequence of the myriads of plant lice present; and recently it has shown its ability upon the newly appeared louse in the cane fields at Kauai, Oahu and Maui. It has spread within one year, after being distributed by you, over all parts of the Islands, and was met with both on Hawaii and Maui as high up as timber will grow. How unfortunate, that upon such beneficial friends we should find a parasite destroying the same to a large extent, yet such is the fact. Everywhere the beetles may be found, apparently at rest on the leaves, yet under it and between its legs a small yellowish silken cocoon is found, from which in due time hatches a small black hymenopterous parasite, Centistes Americana, Riley, an insect found all over the world preying on aphid feeding lady birds. How long the parasite has been present on the Islands is hard to say. Undoubtedly it had been breeding upon Coccinella abdominalis many

years. It had been found upon the same by Messrs. Miller and Wait at Kona before the introduction of other Coccinellids by me. Leis conformis, Boisd. had been observed breeding upon the orange Aphis early in 1894. Another very valuable lady bird that feeds upon the various Aphids, and one that had always been found in small numbers only in Australia is Platyomus lividigaster, Mulsant. It was met with in that country from New South Wales up to Cairns, Queensland, and chiefly upon the orange Aphis. It was also noticed that a larger percentage of their larvae were destroyed by a parasite, and owing to this fact the comparative scarcity may be accounted for. On the other hand, there is no such parasite as yet known in the Islands, the beetle was never yet found destroyed by the Centistes fly and in consequence may even prove of more value in time than the Coccinella rapanta. Its dusky larva is unlike those of the Coccinella proper; it is covered all over with long spines for protection. The rather small black beetle is nearly round and has the sides of thorax bright sulphur yellow. It is a most active creature.

Of Orcus, O. Chalybeus, Boisd. has increased most upon the various Diaspidinae chiefly, yet it will feed upon most any scale as well as Asphids. The Cryptolaemus montrouzieri, Mulsant, is in my opinion the most valuable lady bird introduced into the Islands. It is always found upon any plant infested with Mealy bugs. It relentlessly follows up that destructive Pulvinaria and devours its eggs. It likewise devours Eriococcus araucariae, Maskell, infesting the various Araucarias. You distributed the same during 1894, and on my recent inspection it was met with everywhere on all the Islands upon its fast

disappearing food; around the Volcano, upon the various forest trees and shrubs it was very numerous; from there down Pahala over the lava flows it was numerous upon the scanty bushes growing. In Kona it was met with up to an altitude of 6,000 feet, and here was simply swarming upon Myoporum sandwicene, Gray, infested with Lecanium fillicum, Boisduval, its larva feeding upon the Dactylopius present. On Maui it was found upwards to the timber line and is very likely even higher. That far famed Vedalia cardinalis, Mulsant, did good work in Honolulu upon the one scale, Icerya purchasii, Maskell. The Crytolaemus beetle did equally well upon about a dozen species of coccids. Many other enemies were introduced for the Icerya scale, and one of them at least, Novius Koebelei, is at present abundant.

Of Rhizobius a large number of species were introduced, and R. ventralis, Erichson, that feeds upon the various Lecanidae, has become the most abundant. It will feed upon Pulvinaria as well and can at any time be found upon Araucaria trees, preying upon Eriococus; owing to its valuable work the numerous species of black scales are disappearing. At the Kapiolani Park the Casurina, formerly a complete black mass, owing to the numerous Lecanium longulum, Douglas, have entirely recovered from the blighty appearance, and both the beetles and larvae could be found in any numbers during summer. Of the smaller Australian beetles, Cyreme nigellum, Blackburn, has perhaps increased most, and it was met with everywhere in Honolulu.

With the Ceylon Coccinellids nothing could be done, the distance is too great and all arrived at Honolulu dead. One of these, and certainly the most valuable found there,

Chilochorus circumdatus, Gyllh., was later sent over from China. This insect had been recorded from Ceylon, India, and Sumatra, and consequently its occurrence around Hong Kong could be expected. During three months, Oct. to Dec., '95, a careful search had been made in the neighborhood of Hong Kong, and of the insects introduced many are breeding in the Island.

Synonyche grandis, Thumberg, is the largest known lady bird that feeds upon Oregma bambusae, Buckton, infesting the various Bambus plants in the Malay Archipelago, Ceylon, China and the southern Japan. A fresh specimen of these was found upon orange Aphids in Honolulu on May 6, 1896, and may have bred here. Verania discolor, Fabr., found near Hong Kong and Swatow was again met with in Honolulu eleven months later; it feeds upon Aphids. Coelophora pupillata, Swartz, found common near Hong Kong upon Celtis sinensis, infested with Psylla, was met with all summer upon Aphis at Honolulu.

Coelophora biplagiata, Swartz, collected and sent from Hong Kong, has been noticed in Honolulu for several months after my return. Chilomenes quartriplagiata, Swartz, had been observed breeding upon plant lice, and Dactylopius and will prove a valuable addition. Cryptogonus orbiculatus, Gyllh, is a very common little lady bird. It was found numerous upon orange, etc., at Atami, Japan, it was breeding by the thousands upon Mimosa pudica, L., infested with Dactylopius adonidum, Linn.—the common Mealy bug,—at Conloong, China, and in Formosa again, it was numerous upon the tea plants that were infested with Chionaspis theae. This will be another valuable help in destroying the various Mealy

bugs. The beetle was found very numerous during Nov. at Honolulu.

Platynaspis nigra, Weise, has been sent both from Japan and China, in the former country it was always one of the commonest lady birds upon orange infested with Diaspidinae. At Yokohama it was bred in numbers from a small powdery white larva on trunk of Styrax japonica S. and Z. It was always in numbers upon camellia hedges infested with various scales; found common in China upon orange and feeding upon Aspidiatus, Diaspis and Mytilaspis; also at Formosa numerous upon Chionaspis theae. In Honolulu likewise, the little beetle lives upon the hardest scale insects such as Aspidiotus aurantii, Maskell, A. longispina, Morgan, and Mytilaspis citriocola, Packard.

Sticholotis punctatus, Crotch, was found in Japan and China, in Honolulu during the summer always upon Eriococcus araucariae, Comstock, upon Aleurodes sp., infesting Jasmin, and upon many other plants. While searching for Coccinellidae to be forwarded to the other Islands, in the beginning of November, the little beetles were swarming, so to speak, in the Government Nursery upon most the tree trunks, on fences, etc., searching for a hiding place to winter in. The species of lady birds enumerated above are by no means all that have established themselves on Oahu. Only in some four gardens in the city where they collected, and a thorough search for them no doubt will reveal many other forms; some may even breed in the forests on the mountain where we have not looked for them.

Of the other introduced predaceous and parasitic insects, it appears that some Syrphid and Chrysopa flies

are established. Chalcis obscurata, Walker, is making war in earnest upon the Pyralid larva destructive to the cocoanut leaves, banana, sugar cane, etc. Finding such an abundance of Lepidopterous larvae it also preys upon those of Tortricidae A. congenial climate, and no parasite present to prey on its own larva, it is no wonder that within one year this parasite has increased to such an extent that on one occasion, at the beginning of November in Mr. Jaeger's garden, they were seen flying around the trunk of Pritchardia filifera, which has still all the old leaves remaining on the stems, in a perfect swarm. It is in such places that they hybernate for a short time. The insect was found in numbers upon orange trees in the early spring at Japan. In China during November and December they could be found by the dozens sitting amongst the leaves of Pandanus. This Chalcid fly was met with all over the Island of Oahu during the summer, flying actively around the shrubs and trees in search of their prey. It was sent to Kauai and Hawaii. A second introduced parasite was found to prey upon the Pyralid larva on cocoanut leaves, a species of Proctotrupid, not yet identified, it was sent from Japan with many other forms; this also was introduced on Kauai.

In addition to the numerous predaceous and parasitic insects, it was also found advisable to introduce Bats, Toads and Frogs. So far the results of the introduced California Bats, of which over six hundred reached the Islands living, has not been very encouraging, since little is seen of them in Honolulu. Several trials with Japanese bats resulted in a failure. On the other hand toads from California and Japan are breeding and the four species of Japanese frogs no doubt as well. The benefit

to the Islands through the introduction of these Batrachian will be considerable. Since all of them live chiefly on insect life, they will have sufficient food for a long time to come, on the numerous Japanese beetles (Adoretus umbrosus, var. tenuimaculatus, Waterh), on the cane borer (Sphenophorus obscurus), and the numerous cut worm larvae.

A great many of injurious insects are yet present on the Islands, and they will be dealt with entirely by introducing natural enemies for the same. Artificial remedies even if effective for a short time are too expensive, and if possible I will not recommend such. We cannot use effectively washes or hydrocyanide acid gas, as is done in America, without injury to the tropical plants. I have taken the work upon me to do the best for the Islands without further expense, and I will not recommend nor even approve of them. (We yet will have to deal with the various cut worms and other noctuid larvae that are a serious drawback to the growing of garden produce.) Agrotis ypilon, Rott, a cosmopolitan insect, is probably one of the commonest and most injurious, it is found on the sea shores and up to the highest mountain peaks. A. saucia, Hbn, another moth found everywhere, was also observed to attack garden vegetables on the higher elevations and also a number of other species of Agrotis equally injurious.

The American army worm, Lecania unipuncta, Haw. is very numerous. It feeds upon grasses, and consequently equally well upon the sugar cane. At Olaa a Noctuid larva was seen swarming upon and destroying the various weeds amongst the coffee plants, not feeding upon these however. The larva of Plusia verticyllata is doing more

or less damage to the young coffee plants. The most numerous of all however is the Peelua, Laphygma frugiperda, Hbn., occasionally found covering grass lands for miles. Then there are large numbers of Tortricids, Pyralids and Tineids present. All the introduced species are injurious in more or less extent according upon what they feed.

Upon all the many introduced species of Moths there are exceedingly few introduced parasites to be found, the indigenous forms living upon native moths are hardly ever met below an elevation of 1,500 feet. The most valuable parasites of Noctuid larvae are the Tachina flies, of which but one native species exists on higher elevations.

Of Migrogaster, none have been observed upon Noctuid nor Sphingid larva on the Islands. Many injurious moths have found their way to the Islands, yet save a very few hymenopterous parasites, we may say they practically enjoy an almost entire immunity from such.

A small white fly, a species of Aleurodes, is causing some anxiety in Olaa district. They have increased enormously upon the coffee trees. Many insects preying upon the same were recently sent there, and others will follow in succession, as well as internal parasites, and I am confident with these they will speedily disappear. At the same place Slugs are also destructive, and a trial will be made to introduce such beetles as are known to live upon the same.

The Japanese Beetle.—This beetle, Adoretus umbrosus, var. tenuimaculatus, Waterh., has been probably introduced from that country, and more than likely in the soil coming with the numerous plants from there. I met

with the insects quite frequently during summer around Yokohama, especially while collecting in the forests, where they fell in my umbrella while beating for the various cocinellidae on oak, alder and many other forest trees upon which they feed at night. Not in one instance did I see a specimen in a garden. It is the various species of Cetonia that come to and eat the flowers in gardens, and principally the roses. Repeated search was also made for the larva of these beetles in gardens, yet it is always that of other and larger species that are met with in such places, and the injury caused by them by eating the roots of the various garden plants is very annoying. It was observed at one place that the most of the violets were practically eaten by these larvae under ground. Mr. Alfred Unger of Yokohama, related to me an instance of the value of the mole as an enemy for the Scarabaeid larva which is worthy to record. A gentleman at that place, in building a lawn for a cricket ground, had a brick wall surrounding this to a depth of several feet to prevent the moles from injuring the lawn. All went well for a few months, at the end of which the grass begun to get yellow and die off. All efforts with manure and water were useless, and he continuously found larvae of Scarabaeids that had come to the surface to die. Nothing could be found to remedy the evil until Mr Unger advised the gentleman to tear away the wall and give the moles access to the larvae, which was done, and to the pleasure of the party, his lawn soon recovered.

The beetle at the present time is found all over Oahu, on Maui and Kauai and it will be but a question of time when they will appear on Hawaii, if they are not already present. In going over to Kauai, the insect was found

flying around the lamp on the steamer, and also off Maui, on the way to Hilo, one of the insects was found in similar condition. The most trouble will be experienced by the same in the drier localities, whilst in places like Olaa, the fungoid disease destructive to the same will flourish upon and destroy most of them.

Annual Broods.—In Japan, where the temperature will probably allow the larvae but six months active life, it may be that there it has but a single annual brood, and with the many enemies present it is no wonder that the beetle in consequence can be called rare. I have had the larvae barely out of the eggs in Honolulu, and yet in three weeks later they were full grown upon the decayed manure—not in general use in Japan—where they doubtless fed upon decayed vegetable matter, as they also do on the Islands. The elongate small white eggs hatch in about seven to ten days, and the pupae gives forth the mature insect in from ten to fourteen days. Thus it will be seen that the whole transformation takes from six to seven weeks in summer at Honolulu.

Food Plants.—These are too many to be enumerated. After the roses were gone the beetles paid their attention to various other bushes and trees in Honolulu, and but few remained entirely free from their attacks. The orange was more or less attacked, and so had been the Arabian coffee tree, yet the Liberian coffee tree in some instances was practically defoliated, as were peach trees. The taro and cane leaves are also relished; they like the guava, alligator pear, pomegranate, Java plum; the grape vines are defoliated, and so is the umbrella tree (Terminalia catappa), various palms, especially Areca Phoenyx and Cycas; many of the garden plants, as the Mexican

vine, sunflower, and even violets, suffer from their enormous appetite. Many more plants could be mentioned, but it would be far easier to give a list of such not attacked by them. The same could be said of their work in the forests; here also some of the trees had the appearance as if fire had gone through them.

Enemies.—As the beetle is a night-flying insect, only becoming active after the few insect-feeding birds have gone to rest, and as there are no moles present, not even a single Carabid beetle to feed upon the larvae, these can breed in hundreds. The minah bird no doubt devours all the beetles that he can get, yet we never have observed it to search for the same as does the house sparrow. Almost every crevice was examined around houses, walls, etc., and the rough bark of trees likewise. Here the sparrows could be seen climbing up and down the bark nearly as well as a woodpecker, searching for these beetles for its offspring.

Sarcophaga flies were repeatedly bred from jars containing these beetles, and on an old fern stump, hollow within, where the beetles secreted themselves, the newly hatched flies were almost daily observed sitting on the outside. It is a well known fact that these flies are not parasitic, strictly speaking, and the young maggots are likely left upon the dead beetles only.

During April last, upon an old root with ferns growing on same, hanging suspended, on the hotel veranda, I found successively three dead beetles, covered by a greenish gray fungoid. The respective root had been brought down from the mountains previous. From out of them the spores were taken and brought in contact with twenty healthy individuals in a glass jar kept slightly damp with

Sphagnum moss. They were daily given fresh food, as during all the subsequent experiments. To my astonishment and delight, thirty hours later, one of the beetles was seen dead, with its legs outstretched, and on the various joints the white fungoid growth made its appearance. In two days more the grayish green fruit was present. For weeks these experiments were kept up, always with good results. The fungoid was most successfully raised upon sterilized black bread; less so on white bread, potato with glycerine, sweet potatoes, gelatine with Agar-Agar, banana and fruit juices. Later on the beetles were placed in large tight wooden boxes, the bottom of which was covered with about one inch of slightly damp soil; a few handfuls of dead beetles showing spores were placed on top of this; fresh and slightly damp food was given, and the healthy individuals placed within. Thus we infected quarts of beetles that were distributed all over the Island, and many parties again raised their own seed for distribution. Numerous eggs, placed in infected soil chiefly, hatched; yet all the minute larvae became affected at once after issuing. A few remained unhatched and the larvae were found dead within, yet to all appearances not affected. Larvae dusted with the spores, as a rule begin to die in about five days, become blown and hard, sometimes with a reddish tinge; soon the fungus growth shows on the outside until the larvae appears all white. In a couple of days later the fruit appears, and again the larva slightly shrinks and is covered by the millions of greenish gray fruits or spores. On May 9th a lot of larvae were dug up in a garden, dusted with the spores and replaced. On examining the ground again, May 16th, some were found dead and hard; upon those

the spores were ripe two days later. Pupae dusted with spores never hatches, and always produces the fungoid disease.

The virulence of the same upon the beetles was shown already, on August 4th, at Spreckels' garden, under one of the badly eaten Terminalia catappa trees, the dead beetles could be counted by the hundreds; even on the partly devoured leaves specimens could be seen with stiff, outstretched legs. Likewise at the Government nursery, large numbers of them were lying on the ground.

Both the larva and mature insects of the cane borer are affected by the disease. Later in the season, in a garden where experiments had been carried on, not only did I hardly find any more living larvae of Adoretus, but those of the Aphodius as well were destroyed.

Tineid larvae were found destroyed by the same, and also nice specimens of Noctuids covered with spores were preserved. The large Cerambycid larvae (Aegosoma reflexum) so destructive to sugar cane at Spreckelsville was likewise destroyed by this fungoid. Roaches are as well subject to its virulent effects.

There is little doubt in my mind that in damp localities at least, the beetles will have little chance to become very numerous, but how effective the disease will be in dry localities and Honolulu, the next summer will show. The spores have been sent to Washington and Brisbane, Queensland, for experiments at those localities.

A small green Tineid larva appears upon the leaves of sweet potatoes, within which it mines, causing the leaves to turn brown and dry up, and in consequence the plants die off; this is the "Ponalo" of the natives, often destroying the entire plants in whole districts, and bringing

great suffering among the poorer classes. The larva likewise lives upon the various other Convulvulus.

The insect was seen at work at Olaa, where in about a week's time the whole field of sweet potatoes had turned brown, not a single parasite or predaceous insect was noticed among the myriads of minute larvae that pupate anywhere on the outside of the leaves to a naked Chrysalid.

This and the somewhat allied Plutella cruciferarum living upon the various Cruciferous plants need immediate attention, and hopes are entertained that with the introduction of proper parasites they will become less to such extent as hardly to be noticed.

In April, 1897, I visited Arizona and later Mexico, remaining in the latter place six months, for the purpose of finding predacious and parasitic Insects for the injurious species on the Islands.

As the Japanese beetle, *Adoretus umbrosus*, F., is as yet one of the most numerous and injurious species, and indeed one of the most difficult to deal with; particular attention had been paid to the same and all predacious beetles likely to feed upon it have been collected and forwarded with a view to establish the same on the Islands.

First, some months were spent in California in collecting material, the chief of which consisted of predacious beetles, parasites for cut worms, etc., and again large quantities of Lady birds were forwarded from the same place, such that prey upon scale insects and plant lice. *Hippodamia* and *Coccinella* of which all species chiefly feeding on Aphids were sent, and specimens of these as

all other introduced material will be deposited in the Bishop Museum for future reference.

But one species *Cycloneda-occulata* Fab. was found preying upon the so called white-louse, *Aleurodes*, (common on coffee plants at Olaa) in Sonora, Mexico, yet very few larvae only were observed, in fact so far, I have met but rarely with the species. *Chalcid* parasites preying upon this particular white-louse were sent from Mexico.

Cycloneda sanguinea, Linn. is found from the northern parts of the U. S. to Peru; it feeds principally upon Aphis and has been sent repeatedly. The species was bred in California from larvae feeding upon Lachnus on pines, it was met with in former years very numerous upon coniferous trees infested with Aphids at Oregon and Washington, and was found under similar conditions on Popocatapetl, Mexico.

Adalia bipunctata, Say, was found most common upon orange infested with Lecanium Hesperidum in California.

Harmonia picta, Boisd, is another form found chiefly upon coniferous trees and preying upon Aphids, it is a common insect and had been collected from Washington south to California and upon the same trees in Mexico, 11,000 feet altitude on Popocatepatl.

Psyllobora taedata, Lec. that feeds upon Oidium was sent in large numbers, it is this insect that is found breeding so numerous upon mildew on grapes and other plants in California during the later parts of summer, I also met with it in the hottest parts of Sonora, Mex. and no doubt it will succeed in the Islands.

Of the scale eating species of *Coccinellidae*, the most important species observed is undoubtedly *Chilochorus*

cactii, Linn, a very widely distributed species, it is found in California, Texas, Mexico, South America and the West Indies, and I am confident that it will show itself on the Islands as does *Ch. circumdatus*, Schon, imported from Southern China.

With this, *Ch. similis*, Rossi, from Japan, and *Ch. bivulnerus* from the U. S., the Islands are well supplied.

All through the hot and dry regions of Arizona, on *Aspidiotus* on mesquit, on a same scale and *Diaspis* on Oaks; every where in Sonora; at El Paso, Texas, and in all parts of Mexico visited Ch. Cacti was met as one of the most valuable enemies for scale pests in general. The oleander bushes in the Alameda at Cuautla, Morelos, were completely covered with *Aspidiotus nerii*, Bouche, on my first visit to that place towards the end of the dry season, (May 30). This beetle was quite numerous on the same, about six weeks later large numbers of larvae of the same were dying for want of food, so numerous had become the beetle that many of the thicker branches for one or two feet in length were completely covered by pupae of the beetles, many of them but very small, from partly starved larvae. I was quite surprised to meet with the insect breeding upon the Cochineal at Mixcoac, August 11; and on *Dactylopius* at Tlalpam near Mexico during October.

Hyperaspis lateralis, Muls., feeding on *Pulvinaria* and *Dactylopius*, as observed in California, Texas and Mexico, may prove of great value, the insect was sent in large numbers.

As yet the most of the Mexican coccinellids are not identified, and more details can be given later on the habits of the various species sent.

Among other predacious insects a large number of carabid beetles were sent to the Islands such that prey upon cut worm, etc.

Omus californicus, Esch. resembling the tiger beetles, yet more powerfully built, and roaming at night in search of prey.

Of Cychrus, three or perhaps more species were forwarded *C. cristtstus*, *Harr.*, *C. interruptus*, *Min.* and *C. sriatopunctatus*, *Chd.* These like Omus are wingless insects and are out at nights for their prey, consisting chiefly of snails and slugs.

Some five species of *Calosoma* were sent from Mexico, some of the largest and most powerful of the Carabidae which fly at night and live chiefly upon cut worms and other caterpillars even ascending the trees in search of their food. These beetles often come to the electric lights at night and may always be found where their food is plentiful.

Under a bushy creeping *Ipomoea*, (always infested with caterpillars) the beetles were often met with, yet their larvae were always more numerous, and this was always the case under *Crataegus*, the leaves of which are often entirely eaten by a saw fly larva. Surely, aside from parasites, such beetles are wanted, not only for cut worms, but also for the Geometrid larvae annually defoliating the Koa trees.

Always in search of a possible enemy for the Japanese beetle, I was indeed delighted, on the late afternoon of July 31, on the barren and rocky hill tops near Toluca, Mexico, (it had been a very cloudy and rainy day), to meet with five large Carabid beetles, *Pasimachus tolucanus* Chand. two of these standing upright with their great

jaws open, whilst the remainder were engaged in the act of devouring a pale June bug flying about in large numbers, this latter is not unlike the destructive *Adoretus* of the Islands and in size is about the same, apparently belonging to the genus *Cyclocephala*. Many times later I visited those hills at dusk in search of these beetles, but all in vain, it had to be looked for elsewhere, and as was later observed, it preferred the larva, (rather than the mature insects) of the June bugs. Under heavy stones, in the loose soil, under bushes and Agave growing plentiful at the place, the beetles, and its long slender active larvae were found, here living in tunnels of various lengths, ending several inches below ground; repeatedly, both the beetles and larvae were found in the act of devouring the root feeding larvae of Melolonthidae. This Pasimachus beetles are gifted with enormous appetite; fifteen to twenty beetles would devour from fifty to sixty June bugs of the size of Adoretus during a single night; or as many or even more larvae of same, whilst cut worms inclosed at the same time were hardly touched.

During the following six weeks at intervals, with the help of numerous Indians, the country was thoroughly searched, and I succeeded in getting a large number of this beetle to the Islands in good condition.

Of not less importance was the discovery of a fly parasitic on Scarabaeidae, yet unfortunately late in the season. I have first found a death larva of a very large Scarabaeid not known to me, abundantly under logs, moss, etc., and feeding on decaying vegetation, within which several maggots were found. Later various scarabacid beetles were often seen laying about dead with outstretched legs, and maggots were found in the following

beetles, *Canthon*, such large forms as *C. gagetinus*, various species of *Phanaeus*, a large unknown form which was found at the side of a stone, apparently but recently dead, five maggots were found within the same a few days later; and also in *Pinotus*, *Geotrupes*, *Lachnosterna*, *Cyclocephala*, *Ligyrus*, etc.

The single fly bred was from a species of Lachnosterna and is a species of *Sarcophaga*, flies that produce living maggots by the thousands. I have bred them from grass-hoppers in California and in New Caledonia in former years. No doubt this would prove a valuable enemy for Melolonthid beetles not only for the Islands, but many other places as well.

As already stated and owing to the late discovery of the parasite I have been able to get but limited number of puparias of the same, and even these were mostly destroyed by ants that discovered the same on trip to San Francisco, as stated by Mr. Alex. Craw, who kindly cared for and forwarded all the insects by steamer.

Two species of Fungoids were found in Mexico destructive to Melolonthid beetles and both of these resemble those found, and successfully experimented with, in the Islands, if new, they will be tried upon the Adoretus beetle.

Some ten years ago a coleopterous larva was found near San Francisco in the ground and feeding upon eggs of grass-hoppers, the beetle was bred and proved to be *Coniontis eschscholtzii*, Mann. A similar Tenebrionid larva was found in Morelos in the act of feeding upon a larva of a scarabaeid beetle in the ground. Some of the Tenebrionid beetles may be of valuable service in feeding upon larvae of Adoretus, but as yet none were sent to the Isl-

ands for as Dr. Howard informs me, some of the species are injurious and should be carefully studied before an attempt is made in introducing the same.

About the same time, while collecting noctuid larvae in ground and near sea shore, a long slender white dipterous larva was met with in numbers, and some carried in a box with cut worm larvae, had destroyed most of them on reaching home; a matter of about twenty minutes. Two of the flies were bred at the time and were forwarded to Washington. Dr. Howard reports that the flies bearing the particular number could not be found, and consequently I have no further knowledge as to the name of the insect, but if my memory serves me right it is close to *Anthrax*. The last few weeks I have made further observation upon the same larvae; they are found quite numerous in the loose sandy soil of Alameda and very near the surface, they so far have not been noticed to injure plants, but were repeatedly found in the act of feeding upon the larvae of *Serica mixta*, Lec. that feed upon living roots of plants. This Serica beetle somewhat resembles the Japanese insect on these Islands, especially in larva state, I also found them feeding on larvae of wire-worms, Elateridae, injurious to taro plant, etc., especially in Kona.

These larvae will be thoroughly studied and the mature insects bred before liberating the same on the Islands where they may prove of immense value, not only preying on larvae of the Japanese beetle but on those of the Noctuidae, cut worms, as well as upon their chrysalids.

Upon scale insects in various parts of Mexico, fungoids destructive to some were found, chiefly upon Diaspidinae and also Dactylopius. One of them at least appears to

be identical to *Microcera coccophila* met with in Australia, Ceylon, China, Formosa and even in warm parts of Japan; efforts will be made to cultivate and introduce these in the Islands.

Respectfully submitted,

ALBERT KOEBELE.
Entomologist.

REPORT

OF THE

Board of Fire Commissioners.

HON. J. A. KING,
MINISTER OF THE INTERIOR,

SIR:—I have the honor to present herewith the Report of the Board of Commissioners, Honolulu Fire Department, for the Biennial Period ending December 31st, 1897; together with the Report of the Chief Engineer covering same period to which you are respectfully referred for a detailed account of the Department.

The Fire Losses for the two years amounted to $61,281.00. These losses are as follows:—

Campbell—Ehlers' Fire	$ 42,537.00	
W. H. Cornwell, King St.....	6,000.00	
Gray—Farrington, Waikiki ...	4,500.00	
51 Sundry Fires.....	8,244.00	
		$ 61,281.00

The interior of the Building in the Campbell-Ehlers' Fire was a raging furnace before the Department receiv-

ed the alarm, but the damage was confined to that building. The buildings and contents in the Cornwell and Gray-Farrington Fires were practically destroyed before the apparatus could cover the distance from the Stations.

The small amount of loss ($8,244.00) in the remaining 51 fires indicates the high efficiency and activity of the Department.

For the purpose of indicating more definitely the location of Fires, the system of sounding alarms has been changed during the period by the introduction of a Schedule of Fire Alarm Stations and Steam Whistle. This has been effected by the gratuitous co-operation with the Department of the Hawaiian Electric Co. and the Mutual Telephone Co. It is a marked improvement and is appreciated by the public at large.

On December 1st, 1897, the Department moved into the

NEW CENTRAL STATION

which stands as a creditable monument of your administration and an ornament to the City. Through economy in handling the Maintenance Fund of the Department, the Commissioners were enabled to properly fit and furnish the Building without further appropriation.

The Commissioners have recently been offered the Steam Engine, Hose Reel, etc., formerly used by China Engine Co. No. 5 for the sum of $1,500.00 by the United Chinese Society, the present owners, who propose to use the proceeds of the sale, if effected, for the benefit of the Chinese Hospital. The Steamer, when fitted with new tubes and slightly repaired can be used advantageously, and in view of past services and good faith of these people in connection with the Department, the Board re-

commends the appropriation of the sum necessary to make the purchase.

Your attention is respectfully directed to the recommendation of the Chief Engineer in the matter of equipment of a Modern Hook and Ladder Truck. The Commissioners are of the opinion that present conditions warrant this addition to the Department and are convinced that in the near future its need will become plainly apparent. The Board commends the proposition to your favorable consideration.

The Board wishes to reiterate its advocacy of the establishment of a Chemical Fire Station on the Plains.

The Commissioners would commend the Chief Engineer and his associates for their excellent work during the period; they also desire to express their appreciation of your hearty co-operation with the Department in all matters relating to its welfare and efficiency.

Respectfully submitted,

ANDREW BROWN,
Chairman Board of Commissioners, Hon. Fire Dept.

Honolulu, January 25th, 1898.

MR. ANDREW BROWN,
Chairman Board of Commissioners, Honolulu Fire Department,

SIR:—I present herewith the Report of the Chief Engineer of the Honolulu Fire Department for the Biennial Period ending December 31st, 1897.

FIRE ALARMS.

During the period there have been a total of 56 Alarms caused as follows:

Explosion Kerosene Oil Lamps	6	Matches	5
Spontaneous Combustion	9	Rubbish	5
Defective Smoke Stacks	6	Kerosene Stoves	2
Tobacco Smoking	3	Boiling Mixtures	3
Electric Wire Fuse	1	Lime	1
Fire Works	1	Brush Fire	1
Unknown	10	Charcoal Iron	1
False Alarms	2		

FIRES ACCORDING TO WARDS.

Ward.	Fires.	Ward.	Fires.
1	3	9	3
2	3	10	3
3	11	11	2
4	12	12	3
5	3	13	7
6	4	14	0
7	2	15	0
8	0	16	0

LOSSES AND INSURANCE.

Total Loss	$ 61,281.00
Insurance on property at risk	40,700.00
Losses paid by Insurance Companies	32,206.00
Losses not covered by Insurance	28,825.00

APPROPRIATIONS AND EXPENDITURES.

PAY ROLLS.

Amount appropriated	$ 41,400.00
Amount expended	41,375.00
Balance	$ 25.00

MATERIAL AND SUPPLIES.

Amount appropriated	$ 14,600.00
Amount expended	14,426.24
Balance	$ 173.76

RECAPITULATION OF EXPENDITURES.

Pay Rolls		$ 41,375.00
Rent	$ 2,090.00	
Horse Feed	3,276.43	
Horse Shoeing	563.75	
Telephone Service	599.00	
Harness Repairs	222.75	
Apparatus Repairs	1,500.82	
Kerosene Oil	146.30	
Fuel	48.50	
Fitting, Furnishing, Electric Wiring, &c, New Central Station	1,586.17	
New Apparatus	454.10	
New Harness	326.77	
Horses	700.00	
Drugs and Chemicals	287.43	

Extra Labor	134.08	
Supplies and Sundries.....	1,652.09	
Fixtures and Furniture.....	38.05	
Hose	800.00	
		14,426.24
Total		$ 55,801.24

CONDITION OF APPARATUS.

All the Apparatus has been well and sufficiently repaired as occasion required. The Amoskeag Engines of Station II. are in serviceable condition but provision must be made to renew their Boilers. These Boilers have been in continuous use 14 years and both were patched during the past year. Otherwise the apparatus is all in excellent condition.

CONDITION OF THE COMPANIES.

Increased liberty to the Members and better remuneration to Hosemen have done much to raise the personnel of the Companies and the present condition is first class.

The Department moved Station II. from its old quarters on Union Street into the

New Central Station

at Fort and Beretania Streets on December 1st, 1897.

RECOMMENDATIONS.

The time has come in my opinion when this Department should be equipped with a Modern Hook & Ladder Truck.

The rapid increase of large business blocks in the City ranging from two to three stories in height, make this addition one of imperative necessity, if these and contiguous properties are to be accorded the protection properly due.

The force required to man a Truck suitable to the requirements of this City, is a Driver and Seven Truckmen. The Truck itself will cost inside of $3,000.00.

I have heretofore urged strongly the increase of Hosemen in the Department, as we have but 7 movable men at a fire, the rest being confined to the apparatus, as Drivers, Engineers and Stokers. This force is altogether inadequate to present needs. The Truckmen, if commissioned could be worked in with the Hosemen and this dangerous weakness would in consequence be removed.

STATION ON THE PLAINS.

My advocacy of the necessity of a Chemical Station at the Old Base Ball Grounds in the midst of the most extensive residential portion of the City is on this occasion more urgently renewed on account of the greater amount of property at risk.

CISTERNS.

We have 5 Cisterns for Fire Service in the City located as follows:—

King and Maunakea Sts., Capacity	24,600	gallons.
Hotel and Fort Sts., Capacity	22,400	"
Merchant and Fort Sts., Capacity	15,300	"
Merchant and Kaahumanu Sts., Capacity	18,600	"
Alakea and Hotel Sts., Capacity	16,900	"

These are in a leaky condition and require cleaning and repairing. I would also urge that direct connections be made from water mains to the Cisterns.

I would recommend that the pay of Foreman of Station I. be raised to $75.00 per month.

In closing I desire to express my appreciation of the good conduct of the men of the Department generally throughout the period also my thanks are due to the Minister of the Interior and the Board of Commissioners for their uniform and able assistance in all matters pertaining to the duties of my Office.

I have the honor to be, sir,

Your obedient servant,

J. H. HUNT,
Chief Engineer Honolulu Fire Department.

Honolulu, December 31, 1897.

REPORT

OF THE

COMMISSIONER OF PATENTS.

Honolulu, H. I., December 31, 1897.

HON. J. A. KING, MINISTER OF INTERIOR:

SIR:—I have the honor to submit my report for the Patent Office Bureau for the biennial period ending this date.

Before presenting a list of the Patents granted during the period covered by this report, permit me, in view of the fact that this is the first report presented, to briefly review the history of this Bureau. In the year 1846, under the reign of Kamehameha III. the first provision was made for granting Letters Patent in the Kingdom, this law was very brief, simply giving to the Minister of Interior power to grant patents at the direction of His Majesty in privy council if deemed in the estimation of His Majesty beneficial to the interests of this Kingdom. No drawings or models were required and no limit of time for the life of the Patent. No record is found of patents being issued under this law but in 1859, the orig-

inal law was amended by limiting the life of the patent to ten years and requiring drawings and descriptions of the inventions. In 1868 the law was further amended providing that the fee for a patent granted to a citizen of the Kingdom should be thirty dollars and to a foreigner one hundred dollars, and also providing for the filing of "Caveats" the cost of which should be thirty dollars. In 1884, the laws were further amended by providing for the appointment of a Commissioner of Patents, and reducing the cost of filing a Caveat to five dollars which amount remains unchanged to the present time. In 1888, the laws were again amended to permit an appeal from the decision of the Commissioner of Patents to the Supreme Court in Banco. The laws regarding Patents as amended at this time were copied from those in force in the United States, but were far from complete yet no change was made until the session of 1896, when they were amended by changing the life of a patent from ten to fifteen years and the addition of some provisions found by experience to be necessary.

Rules of Practice have been adopted from time to time and these with the full text of the laws relating to patents have been published for the guidance of those having business with this Bureau and these are called for by persons residing in all parts of the world.

The number of patents granted each year is increasing and in the lines of Sugar and Coffee machinery the demand is greater than in other classes of improvements. This Bureau receives a complete file of the reports of the United States Patent Office and these weekly publications being bound in calf into volumes of proper size, we have a very valuable library the oldest volume of

which is under date of A. D. 1790 and the records on file are very nearly complete from that date to the present. It is necessary that the laws and rules of practice of other countries be on file in this office and steps have been taken to obtain them. Our own laws relating to patents and the rules of practice of this office seem to be sufficient for our present use and probably no amendment will be required at the coming session of Legislature.

The following is a list of the Patents granted during the biennial period just closed:

No. of Patent.	Patentee.
113	E. N. Dickerson & J. J. Sucl
114	S. D. Poole
115	J. A. Rodriquez
116	F. A. Taber
117	David Douglas
118	Sidney Lawrence
119	Henry Arzi
120	Geo. Spaulding
121	W. W. Wright
122	M. S. Cody
123	J. P. Wright
124	Marshall Pridham
125	Marshall Pridham
126	John A. Hughes
127	R. C. Mattingly
128	E. W. Deming
129	C. E. Mormann
130	F. N. Otremba
131	Richard T. Richard
132	James A. Low
133	B. B. Allison
134	S. B. Kenney and Charles vidge
135	Alfred Horne

Telephone	60.00	
Stationery and Office Material	416.02	
Postage Stamps	26.23	
Assistants	176.00	
		$ 1,000.00

We found this appropriation insufficient, owing to the large amount of material required for draughting and blue printing, moreover, it happens occasionally that the business of the office can be very much facilitated by the employment of temporary assistants for special work. I shall therefore ask for an increase in the appropriation.

REPAIRS—FURNITURE AND ADDITIONS TO GOVERNMENT BUILDINGS.

Executive Building		$3,882.01
Judiciary Building	$3,071.03	
" " rear veranda	1,117.20	
Judiciary Building fire-proof vault	701.02	
		4,889.25
Kapuaiwa Building		472.01
Custom House		4,296.81
Pilots' Office		20.84
Post Office		211.03
Police Station		268.59
Oahu Prison		1,681.29
Engine House, No. 1		227.25
" " " 2		50.08
" " " 3		343.01
Central Fire Station		705.32

Electric Light Station.....	169.34	
Forester's House	3.56	
Nursery	6.75	
Government Stables	342.54	
Government Workshop	4.96	
		$ 17,574.64

MILITARY.

Drill Shed .....$	90.80	
Bungalow	125.91	
Barracks Kitchen	94.69	
Barracks W. C.....	3.25	
		$ 314.65

BOARD OF HEALTH.

Insane Asylum .....$	5,345.06	
Dispensary	110.10	
Store House	80.24	
		$ 5,535.40

RENTED BUILDINGS.

Honolulu Hale .....$	372.93	
Old Custom House.....	30.00	
Brewer's Building	26.60	
Steam Laundry	616.00	
Market	207.05	
Market Keeper's House.....	220.22	
Powder Magazine	18.25	
		$ 1,491.05

COURT HOUSES AND JAILS OUTSIDE OF HONOLULU.

HAWAII.

Hilo Court House	$ 912.81	
Hilo Jail	215.14	
Hilo Sheriff's Office	664.65	
Pohoiki Court House	263.61	
N. Hilo Court House	90.71	
N. Hilo Jail	5.60	
Honokaa Court House	333.65	
Honokaa Jail	38.00	
Kohala Court House and Post Office	672.31	
Kohala Jail	9.30	
Waimea Court House	798.85	
Kailua Court House	97.84	
Hookena Court House	73.28	
Waiohinu Court House	20.88	
Waiohinu Jail	7.50	
		$ 4,204.13

MAUI AND MOLOKAI.

Wailuku Court House	$ 2,709.04	
Wailuku Jail	335.38	
Wailuku Jailor's House	365.58	
Wailuku Sheriff's Office	350.80	
Kahului Jail	69.69	
Kahului Jailor's House	4.88	
Paia Jail	18.74	
Hana Court House	2.50	

Lahaina Court House.....	15.75	
Pukoo Court House.....	98.59	
		$ 3,970.95

OAHU.

Ewa Court House.....$	45.21	
Waianae Court House.....	146.07	
Waialua Court House.....	130.74	
Hauula Court House.....	67.37	
Kaneohe Court House.....	127.80	
		$ 517.19

KAUAI.

Hanalei Court House.....$	209.45	
Kapaa Court House.....	207.62	
Lihue Court House.....	553.82	
Lihue Jail	732.98	
Koloa Court House.....	6.00	
Koloa Jail	4.00	
Waimea Court House.....	25.40	
		$ 1,739.27
Hilo Post Office.....		321.10

LIGHT HOUSES.

Honolulu Light Keeper's House..$	31.65	
Barber's Point Light Keeper's House	6.15	
Lahaina Light House.....	22.10	
Makena Light House.....	2.17	
Paukaa Light House.....	169.54	
		$ 231.61

MISCELLANEOUS.

Mausoleum	$ 125.25	
Taking down old buildings	64.80	
Judiciary Building Fence	580.08	
Moving Flag Pole Central Fire Station	360.00	
Macadamizing Yard Central Fire Station	326.69	
Insane Asylum Driveways	1,020.19	
Telephone	24.00	
Advertising	48.00	
Office Assistance	253.00	
Miscellaneous	15.30	
		$ 2,837.31
		$ 38,737.30

Plans were made for an addition to the Hilo Court House to include a room for the Circuit Judge, a law library and more room for the clerk of the court, but it was found an entire rearrangement of the second story would be necessary, and that it would be more economical and satisfactory to make an additional building for the use of the Sheriff. This will include a fire proof vault and will be completed in February.

It was found necessary to replace the slate roof of the Court House with one of corrugated iron. The roofs on Pohoiki and Waimea Court Houses have also been renewed.

A considerable addition was made to the Wailuku Court House giving a jury room, a judge's private room,

more room for the clerk, and a fire proof vault for the preservation of court records. A building was added to accommodate the jail keeper, a new roof put over the jail, and the Sheriff's office moved and the whole building put in good order.

The District Court House in Lihue has been painted, the gutters and all decayed wood-work removed, and the fence repaired. The Court Houses at Hanalei and Kapaa have also been renovated and some new furniture supplied.

LANDINGS AND BUOYS.

The appropriations for Honolulu and Hawaii were exhausted before the close of the period and we were compelled to fall back on the appropriation for Landings and Buoys General. The distribution of work has been as follows:

Landings and Buoys.	Honolulu.	General.	Total.
Pacific Mail Wharf	$ 3,669 05	$ 875 93	$ 4,544 98
Likelike "	328 03	3 89	331 92
Kinau "	593 01	143 56	736 57
Kekuanaoa "	1,563 43	584 11	2,147 54
I. I. S. N. Co. "	3,207 97	887 54	4,095 51
O. S. S. "	1,121 32	389 93	1,511 25
Allen Street "	216 72		216 72
Boat Landing	4 50	23 77	28 27
Brewer's Wharf	1,119 96	318 95	1,438 91
Nuuanu Street Wharf	767 30	94 44	861 74
Sorenson's "	17 25	122 60	139 85
Old Fish Market "	3,545 43		3,545 43
Cattle "	309 39	33 80	343 19

Landings and Buoys.	Honolulu.	General.	Total.
Quarantine Wharf	331 16	.....	331 16
Immigration "	22 69	.....	22 69
Sewage "	1 87	.....	1 87
Tools and Equipment....	191 08	29 99	221 07
Sweeping Wharves	1,139 05	382 20	1,521 25
Anchors and Buoys.....	1,371 36	706 49	2,077 85
Pile Driver	133 87	23 35	157 22
Repairs to boat and scows	127 16	69 44	196 60
Telephone	60 00	24 00	84 00
Wharf Material on hand .	50 75	45 80	96 55
Expense	107 65	14 21	121 86
	$ 20,000 00	$ 4,774 00	$ 24,774 00

The old Fish Market wharf has been rebuilt and extended making a berth 150 ft. long. In order to make a berth for the "Mauna Loa" it was necessary to cut off the front of the I. I. S. N. wharf and rebuild on a new line. Increased traffic increases wear and tear and the expense of keeping up the wharves. We shall need a larger appropriation for the coming period.

HAWAII.

	Landings and Buoys Hawaii.	Landings and Buoys General	Total.
Laupahoehoe Landing.....	$ 258 89	.....	$ 258 89
Hilo Wharf	217 69	.....	217 69
Hilo Buoy.....	213 44	.....	213 44
Pohoiki Wharf.....	717 49	210 58	928 07
Honuapo "	13 72	15 42	29 14
Hookena "	482 91	.....	482 91
Napoopoo "	369 88	.....	369 88
Kailua "	725 98	.....	725 98
	$3,000 00	$ 226 00	$3,226 00

The tidal wave in June, 1896, made considerable repairs necessary to the landings on the Kona side of Hawaii; Kailua, Napoopoo and Hookena. In putting the Kailua wharf in shape, an addition of stone work was made on the back side giving much more room for freight, and in March, 1897, a wharf shed 24x40 was built giving very necessary shelter to the large amount of freight handled there.

At Hookena the boat wharf was raised a foot and a half and replanked.

The Pohoiki wharf has been rebuilt on iron piles, and a small shed put over it.

The Hilo buoy carried away and the anchor and chain were not recovered. The buoy was replaced with new moorings.

MAUI.

Lahaina Wharf	$ 870.15	
Lahaina Buoy	229.15	
Maalaea Wharf	240.86	
Kihei Wharf	369.29	
Makena Landing	67.25	
Nuu Landing	116.62	
Mokulau Landing	37.80	
Hamoa Landing	22.87	
Hana Wharf	135.70	
Keanae Landing	93.03	
		$ 2,182.72

An extension of 24 ft. has been made to the Lahaina wharf, and a substantial derrick built sufficient to carry large pieces of machinery.

MOLOKAI.

Kaunakakai Buoy		$ 3.00

OAHU.

Kaneohe, Channel marks.		$ 21.00

KAUAI.

Nawiliwili Wharf	$ 1,075.96	
Waimea Wharf	1,756.07	
		$ 2,832.03

Nawiliwili wharf was thoroughly overhauled, and the piles in the wide portion covered with cement.

In July, 1897, an extension of 80 ft. was added to the Waimea wharf the outer end for a length of 40 ft. being made 30 ft. wide. The piles in this extension were not coppered but coated with cement, and I hope by this to avoid the frequent repairs which have formerly been necessary on account of the chafing of the copper which is inevitable where there is so much wave motion as at Waimea.

LIGHTHOUSE SUPPLIES.

The oil, etc., supplied to the various lights outside of Honolulu through this Bureau has been as follows:

Nawiliwili	$ 66.60	
Barber's Point	92.50	
Kalaeokalaau	21.90	
Kaunakakai	47.95	
Lahaina	49.20	
Makena	76.50	
Mahukona	17.50	
Laupahoehoe	5.25	
Pepeekeo	5.83	
Paukaa	70.79	
		$ 454.02

PAY OF KEEPERS, NEW LIGHTHOUSES.

Nawiliwili	$225.00	
Pepeekeo	45.00	
Kohala Point	11.65	
		$ 281.65

The light at Nawiliwili was started December 1, 1896; at Pepeekeo, October 1, 1897; at Kohala Point, November 26, 1897; The description and location of these lights will be given later.

STEAM TUG.

The appropriation for the tug was insufficient to meet the expense for the period, and I will give, besides the expense met by the appropriation the amount of bills rendered after the appropriation was exhausted.

	Paid	Unpaid.	Total.
Coal	$ 2,178 02	$ 735 00	$ 2,913 02
Expense, Oil Waste, etc...	1,712 98	140 51	1,853 49
Tools and Equipment.....	158 35	12 40	170 75
Repairs	3,677 33	222 06	3,899 39
Hawsers.....	666 82	.....	666 82
Extra Labor.....	106 50	.....	106 50
	$ 8,500 00	$ 1,109 97	$ 9,609 97

Making the average monthly expense of the tug $400.41 besides the regular pay roll of $525 per month. The increasing work shows in increased expense and no doubt shows in increased towage fees. Two important items of repair were a new rudder stock and new towing bitts.

The tug is probably in better condition at the close of the period than she was at the beginning.

DREDGING HONOLULU HARBOR.

In September and October, 1896, the dredger worked in front of the I. I. S. N., Oceanic and Allen street wharves, cleaning up the bottom to a depth of 26 and 28 ft. and in November, the slip on Ewa side of Sorenson's wharf was dredged to a depth of 26 ft. In July, August and September, 1897, a considerable area of the upper harbor was dredged to a depth of 27 ft. The distribution of expenditure is as follows:

Labor	$ 7,965.95
Coal	3,748.50
Expense	3,140.23

Tools and Equipment.....	28.35	
Pontoon Repairs	726.63	
Dredger Repairs	1,072.03	
		$16,681.69

ROADS AND BRIDGES HAWAII.

NORTH HILO.

Labor	$ 1,359.25	
Freight and Cartage.....	292.96	
Teams	309.25	
Damage to cane, etc.....	204.50	
Laupahoehoe Bridge	76.72	
Sundry Expense	252.82	
Advertising	4.50	
		$ 2,500.00

ROADS AND BRIDGES HILO.

Waianuenue street	$ 1,370.74	
Kaumana road	547.07	
Kaiwiki road	547.10	
Pepeekeo section	433.16	
Honomu section	687.63	
Hakalau section	4,975.54	
Repairs to Crusher.....	46.75	
Survey and Advertising.....	34.00	
		$ 8,641.99

There were special appropriations from the loan fund for the above roads excepting Waianuenue street and after such appropriations

were exhausted, these amounts were expended to complete the same.

Volcano road to raise grade, etc., at 4 mile post	$ 1,000.00

This work was done under contract by J. R. Wilson.

NEW ROAD FROM PAHOA TO HEAD OF RYCROFT'S ROAD.

A contract has been given for the completion of this road and the amounts expended are as follows:

Contract	$ 7,800.00	
Survey	5.05	
Advertising	6.50	
		$ 7,811.55

ROADS AND BRIDGES PUNA.

During February, March and April, 1896, a gang of prisoners was kept at work repairing the Volcano road. The amount expended was ..... $ 1,534.27

ROADS AND BRIDGES S. KONA.

Labor	$ 178.50	
Survey	99.50	
Miscellaneous	32.25	
Road Damages	711.50	
Fencing	249.00	
		$ 1,270.75

N. KONA	21.83
N. KOHALA	220.00
HAMAKUA	50.00
Total for Hawaii	$23,050.39

ROADS AND BRIDGES MAUI.

Lahaina	$ 547.30	
Wailuku (mile posts)	4.50	
		$ 551.80

The work in Lahaina district was the construction of a 40 ft. bridge and masonry abutments crossings the Kahakuloa stream.

ROADS AND BRIDGES OAHU.

EWA AND WAIANAE.

Halawa Bridge and approaches		$ 804.77
Bridge at Waiawa, etc		4,000.00

WAIALUA.

Kaukonahua Bridge	$ 298.40	
Kaupo Bridge	1,520.72	
Waimea grade	1,106.75	
Tools and Equipment	42.10	
		$ 2,967.97

KOOLAULOA.

Laie Bridge	25.53
	$ 7,798.27

A considerable portion of the wood-work of Kaukonahua bridge was renewed. The pile piers of the Kaupo bridge which were badly rotted were replaced by masonry piers, which will be permanent. A new grade was made into the Waimea valley on the road from Waialua.

ROADS AND BRIDGES KAUAI.

Koloa	$ 600.00

This was spent on the Lawai Kahoaea road after the special appropriation was exhausted, $204.05 being the cost of one bridge.

ROADS AND BRIDGES GENERAL.

This appropriation was also used to continue the work on the Lawai Kahoaea road.

Road	$ 1,230.84	
Bridge	231.22	
Fence	132.00	
		$ 1,594.06
Waianuenue street		1,706.65
Kaumana road		71.68
Honomu section		339.04
Honohina section		157.19
Hamakua Homestead road		8.27
Makawao Homestead road		15,80
		$ 3,892.69

ROAD DAMAGES ALL ISLANDS.

OAHU.

Hotel street	$ 36.00	
Waikiki road	254.00	
Fort street	448.63	
Vineyard street	1,317.22	
River street	24.00	
Pauahi street	6.00	
King street	32.00	
Kukui street	12.50	
College walk	355.80	
Beretania street	106.00	
Thurston avenue	69.25	
Waiawa new grade	175.00	
		2,836.40

HAWAII.

Hilo	171.00	
Kau	30.08	
S. Kona	627.31	
N. Kona	586.00	
Hamakua	61.00	
		1,475.39

MAUL

Makena-Kula Road	588.00	
Makawao Homestead	30.86	
		618.86

KAUAI.

Fence Lawai-Hoaea Road	932.18	932.18
		$ 5,862.83

Hilo—

Repairs	$ 150.32	
Pipe Connections	101.98	
Stationery and Advertising	86.20	
Freight and Cartage	17.50	
Office Rent and Horse Feed	144.00	
		$ 500.00

Laupahoehoe—

Repairs	$ 255.02	
Tools and Equipment	6.75	
Stationery and Collectors fees	26.95	
		$ 288.72

KOLOA—5,400 ft. of 3 inch cast iron pipe was purchased and laid at Koloa in place of the wrought iron pipe which would no longer hold water. The cost of pipe and laying is as follows:

Pipe and Connections	$1,231.09	
Lead and Oakum	108.51	
Freight and Cartage	253.70	
Laying	431.35	
Tools and Equipment	31.74	
Miscellaneous	18.41	
		$ 2,074.80

The amount expended during the period besides the regular pay roll of $500.00 per month is $13,000.00, an average of $541.66 distributed as follows:

Extra Labor	$3,137.05	
Expense (Carbons, etc.)	4,571.21	
Repairs	1,561.98	
Teams	1,596.16	
Tools and Equipment	216.03	
New Poles	396.75	
New Material	1,520.82	
		$13,000.00

The new material includes 150 16 c. p. lamps, 4 arc lamps, globes, an amature, 1 plug switch and cables, voltmeter, ammeter, testing set and a number of lamp fittings.

The number of arc lights in operation at present is 109, and the number of incandescent lights furnished to various departments of the Government has increased during the period.

Following is the Collector's Report.

W. E. ROWELL, ESQ.,
Sup't of Public Works.

SIR:—I have the honor to submit herewith my report as collector of rates for the Government Electric Lights, for the biennial period from January 1st, 1896, to December 31st, 1897.

The amount collected during the period was..$2,356.65
The amount outstanding, December 31st, 1897,
was 210.00

There are, at the present time, five paying rates, using 225 lights, the receipts being $78.60 per month.

The estimated receipts for the coming period, at the present rate, are $1,886.40.

Respectfully submitted,

ANDREW BROWN,
Collector of Rates, Government Electric Light.

Honolulu, H. I., December 31st, 1897.

The necessity for more arc lights in the town is greater than ever, and I doubt whether there will be found any more economical plan for obtaining the required power than that recommended and explained in detail in the report of G. F. Allardt, contained in the report of the Minister of the Interior to the Legislature of 1890, p. 168. This is the construction of the storage reservoir above Luakaha and connecting it with the Electric Light Station.

If this is done, power enough can be developed, *without using any more water than has actually been used at the Electric Station during the past two years*, for not only the additional 50 arc lights required, but also to run the pumps at both the Beretania Street and Makiki stations. The saving of the coal over 1300 tons at the two stations will be equivalent to 6 per cent. interest on a capital of $175,000.00 which will probably be sufficient to put the system into operation, and there will be a clear gain of the power for running the electric lights.

ELECTRIC LIGHTING HILO STREETS.

In March, 1897, an offer was accepted from the Hilo Electric Light Co. to furnish 12 arc lights for Hilo streets at $8.00 per month each and 7 incandescent lights on the wharf at $7.00 per month. In October in addition to these, 12 incandescent and 1 arc light were placed on the streets.

The amount expended is $1,354.51.

An appropriation will be asked for an increased number of lights both arc and incandescent.

PUBLIC GROUNDS.

Makiki Square	$ 132.52	
Emma Square	966.70	
Thomas Square	43.15	
Executive Building Curb.....	142.66	
		$ 1,285.03

A fence was built around Makiki Square. The fence at Emma Square was taken down, rebuilt and painted, the seats were renewed and new ones added, and the band stand repaired and painted.

At Thomas Square a small building was put up for laborers' quarters. This has since been removed.

A stone curb was laid around the Executive Building enclosing grass plots on the four sides of the building.

FORESTS AND NURSERIES.

Buildings for a forester's station were erected in Nuuanu valley about a mile below the pali. Cost....$1,833.19

QUARANTINE DISEASED ANIMALS.

A water pipe was laid connecting with Mrs. Ward's artesian well supply, and some repairs made to fence. Amount expended under this Bureau.....$78.65

RUNNING EXPENSES LAUNDRIES.

Fireman and Collector.....	$1,810.00	
Fuel	1,438.38	
Repairs	12.57	
Oil, Waste, etc.....	19.10	
Tools and Equipment.....	19.95	
		$ 3,300.00

This appropriation was insufficient and for the last eight months, only room rent of tenants was paid into the Interior Office, they paying for fuel outside of that.

CURBING AND PAVING GOVERNMENT SIDEWALKS.

This work has been distributed as follows:

Government Storehouse lot Alakea and Allen Sts. curbing	$ 126.75
Queen St. Extension, on harbor and stream side, wooden curb	26.19
Allen St. between Fort and Kekuanaoa mauka side	95.65
Makai side, Custom House lot curbing and paving 70 ft.....	190.00
Market Block	20.25
King St. Old Chinese Theatre lot.....	140.48

Richard St. below Queen	67.68
Alakea St. below Ice Works	63.34
Vineyard St.	334.03
Mililani St.	306.76
Pumping Station lot	83.72
Thomas Square	504.72
Central Fire Station curbing and paving	437.00
School lot Piikoi St.	138.00
Thurston Avenue	99.00
Fort St.	54.92
Kilauea St. Esplanade lot	26.68
	$2,715.17

Nearly all of the curbing has been of native stone. The paving of the Fire Station sidewalk was of native stone that of the Custom House on Allen St. of granite blocks.

BOARD OF HEALTH.

The work done under this Bureau for the Board of Health is as follows:

Disinfecting Plant	$1,123.75	
Fumigating Plant	534.09	
Sewage Scows	783.94	
Water Pipe for Quarantine Island	341.35	
		$ 2,783.13

The Disinfecting Plant furnished last period by C. R. McVeigh was erected on Quarantine Island. The Fumigating Plant is a sulphur furnace and blower for the Quarantine Station similar to the one erected at the

Pacific Mail wharf. The sewage Scows have been repaired and improved. The wrought iron pipe carrying water to Quarantine Island was badly corroded by the action of the salt water and the item above is the purchase of 1500 ft. of 3 inch cast pipe to replace the other.

BUILDING PERMITS.

Permits have been issued during the period, covering the construction, repairing or moving of 395 buildings.

New Buildings	324
Repairs and Alterations	63
Moving	8
	395

GOVERNMENT REALIZATIONS.

The amounts returned to the Interior office from this Bureau have been collected as follows:

Building Permits	$ 1,922.50
Sale of Old Material	543.06
Tools loaned	22.00
Overcharges returned	5.39
Wages uncalled for	24.40
Sale of Blue Prints	7.00
	$ 2,524.35

IMPROVEMENTS.

A large amount of work has been done from the appropriations under loan fund. With very few exceptions every item for which provision was made has been carried out.

NEW SCHOOL HOUSES AND TEACHERS COTTAGES.

OAHU.

High School 4 room	$ 4,338.17	
Maemae 3 room	3,036.85	
Practice 2 room	2,384.00	
Kahuku 1 room	984.25	
Kahuku Teacher's Cottage	546.35	
Ewa Teacher's Cottage	449.00	
Beretania St. School Addition	100.00	
Palama School Painting	36.00	
Fort St. School Desks	241.00	
Waianae School Addition	100.00	
Waiawa School Desks	32.50	
Miscellaneous	18.00	
		$ 12,266.12

HAWAII.

Honaunau 2 room School House	$ 1,972.55
Holualoa 2 room School House	1,361.20
Honokaa 3 room School House	2,831.05
Olaa 1 room School House	599.00
Alae, S. Kona 1 room School House	1,062.19
Papaikou 3 room School House	2,651.56

Papaikou Teacher's Cottage.....	608.00	
Pepeekeo Addition	400.00	
Kalapana, Puna, Teacher's Cottage	797.00	
Hilea Teacher's Cottage.....	287.52	
Kailua. Balance on Contract Sch. House	50.00	
Keauhou. Advertising and freight	19.75	
Hakalau. Freight on desks.....	2.00	
Hilo Waena Desks.....	30.00	
		$ 12,671.82

MAUI.

Kealahou 1 room School House..$	958.00	
Ulupalakua Teacher's Cottage...	580.00	
		$ 1,538.00

MOLOKAI.

Pukoo Teacher's Cottage.....$	615.00	$ 615.00

KAUAI.

Wainiha 1 room School House...$	740.50	
Wainiha Teacher's Cottage.....	495.00	
Makaweli 2 room School House..	1,997.98	
Makaweli Teacher's Cottage.....	549.00	
		$ 3,782.48
		$ 30,873.42

A total of 13 new school houses containing 26 rooms, and 9 teachers' cottages. In every case but one these

buildings were built by contract after advertisement for tenders. Hilea teacher's cottage was built by day work.

NEW MARKET HONOLULU.

Counters	$ 456.48	
Gratings	260.25	
Screen makai end	152.58	
Painting	49.94	
Care of Grounds, etc	100.75	
		$ 1,020.00

NEW LAUNDRIES HONOLULU.

Before the close of last period the drying floor for one 20 room wash house had been made and a contract let for the building.

This period that building has been completed and another of the same dimensions erected, with a drying floor 80 feet wide instead of 60 as with the first. The boiler that came from the old tug Pele was repaired and set to furnish steam for the laundries. The distribution of expense is as follows:

Building No. 1	$ 2,911.20	
Building No. 2	2,801.25	
Coral Floor	3,171.61	
Boiler	1,228.89	
Boiler House	80.32	
Steam and Water pipe and fittings	501.53	
Tools and Equipment	96.88	
Fireman and collector	190.00	
Miscellaneous Expense	18.32	
		$11,000.00

NEW JAIL HILO.

A jail has been constructed at Hilo on the site of the old one 75 ft. long by 30 ft. wide containing 4 cells 12′x6′ 2″, 2 cells 12′x12′ and 10 cells 10′x12′ opening on a corrider running through the length of building. The sides, floor and ceiling of the cells are of 2x8 plank with an iron tongue of 1½′x3-32″ flat iron closing every joint, being let into each plank ¾″. The doors of cells are also made in the same manner. Each cell is ventilated by an aperture through the outside wall closed by a grating.

Besides the jail proper, a new kitchen was built and the fence moved so as to include the whole of the lot, considerable new fence also being necessary. The appropriation was expended as follows:

Contract for Jail	$ 2,425.00	
Kitchen	302.20	
Fence	580.00	
Locks and Hinges	57.80	
Extra underpinning and labor. . . .	70.00	
Inspection	25.00	
Paint for Kitchen, etc.	40.00	
		$ 3,500.00

POWDER MAGAZINE HILO.

A storage magazine 12′x12′ located at Waiakea was completed in August, 1897. The building has a wooden frame covered with wire lath and cement plaster inside and out. Cost $396.80.

KEROSENE WAREHOUSE HILO.

This building is 20′x30′ built on the bank of the Waiakea river convenient for the reception of oil by boat. It will store 2,500 cases of oil. Cost $500.00.

NEW HOSPITAL HILO.

The main building is 65′x30′ with 8′ veranda two sides and front, in which are 6 veranda rooms. Servants' room 30′x12′ connected with main building by a porch. Ceilings in main building are 12 ft. high; sides rustic, lined with T & G. It was built by contract for $2,454.98
Advertising 37.15

Total $2,492.13

COURT HOUSE AND SITE KOLOA.

A site in a central location containing nine-tenths of an acre was purchased from Dr. J. K. Smith and his sisters. The court house has been made 18′x34′ with 6 ft. veranda on one side. A partition divides the jailor's room 10′x18′ from the court room. The sides of building are T. & G. N. W. roof shingled.

Building Contract	$ 685.70	
Advertising	16.00	
Site	501.00	
W. C	30.00	
		$ 1,232.70

The jail will be moved to this lot from the former location which was on leased land, and the lot will be fenced

CENTRAL FIRE STATION HONOLULU.

A commodious building has been constructed of native stone from the Punahou Quarry, on the East corner of Beretania and Fort Sts. It covers a ground space of 93′ 10″ by 52′ 4″. The Architects were Messrs. Ripley and Dickey of Honolulu. The contract for foundations was awarded to Mr. E. B. Thomas Aug. 14th, 1896, the building contract to Mr. A. Harrison who completed it Oct. 21st, 1897. The asphaltum floor and the wiring of the building, were not included in the contract. There were some improvements also, found necessary after the contract was given, which were paid for outside of contract. The fitting up of the building ready for occupancy by the Fire Department was quite an item of expense, the most of which was paid from Repairs, Furniture and Additions to Government Buildings.

The building contains on the lower floor an engine room with stalls for six horses and room for two fire engines and hose wagon, a work shop which may at some future time be used as an engine room, a feed room, watchman's room, &c.; and on the second floor 3 dormatories, a gymnasium, library, office, 3 sleeping rooms for Chief, foreman and truckman, and bath rooms well equipped. A stairway leads from the second floor to a tower room which commands an extensive view along Fort and Beretania Sts. The hose tower rises from the rear of the building 74 ft. from floor to apex of roof. The hose rail is 60 ft. above the floor and the arrangements for washing, hanging and draining the hose are complete.

The building is a credit to the architects and an ornament to the town.

The expense of construction is divided as follows:

Foundations	$ 724.51	
Building Contract	27,350.00	
Flag Pole	80.08	
Extras	203.50	
Fittings	151.41	
Asphaltum Floor	224.75	
Wiring	275.00	
Architects' fee	981.75	
Advertising	9.00	
		$30,000.00

BREAKWATER AND WHARF HILO BAY.

After a careful examination of the Waiakea side of Hilo bay it was decided that the place for the first experiment with a ship wharf in Hilo bay was as close under the shelter of Cocoanut Island as it could be made and reach a sufficient depth of water, and a location was selected for a wharf to run out from the shore next to Waihonu fish pond. A wharf 250 ft. long will reach 22 ft. of water and it iwll be practicable to dredge to a depth of 24 ft.

It was also apparent that it was very important to provide a boat landing where freight could be discharged and passengers land when it is too rough on the Hilo side and too shallow for boats to go up the Waiakea river. A suitable place for this was found under the shelter of Kalauokukui point not far from Reed's landing. This property was under lease at the time, and negotiations were at once entered into with the parties holding

the lease for the surrender of the same to the Government, but an agreement was not reached until the middle of October, 1897. Preparations were at once made; a gang of men were started on a retaining wall of concrete to hold the filling for the back part of the boat landing, and another gang began the erection of pile driver for work on the ship wharf.

The boat landing has a wharf front of 100 feet with a depth of from 6 to 8 feet alongside. Iron piles were let into the rock bottom to support the front, and the shore ends of timbers rest on the concrete wall. The wharf is planked for a width of 30 feet and back of this the filling is brought to the same level. A contract has been made for the erection of a shed 60 feet wide covering two-thirds of the wharf and running back 80 feet, with an over hang so that a boat laying at the wharf will be under shelter. Three sides of this building will be closed, the end at the wharf front being open. Large doors will permit the entrance of teams; at the same time the custom house officers will be able to keep the necessary control over foreign freight. The front of the shed is heavily trussed, and provision made for hoisting freight up to a ton in weight. The ground was so low that the filling to receive the shed was a large expense. The construction of the road approaching the boat wharf was a considerable expense, and that of the road to the ship wharf still more.

The ship wharf will be 60 ft. wide and will necessarily have a shed over it in a district as wet as Hilo.

The amounts expended up to Dec. 31st are as follows:

Ship Wharf—

Labor	$ 977.80	
Cement and Bags	136.35	
Lumber	289.97	
Sheathing	878.11	
Blacksmithing	150.96	
Powder, etc.	125.10	
Freight and Cartage	431.70	
Miscellaneous	20.75	
		$ 3,010.74

Boat Wharf—

Labor	$2,673.25	
Cement and Bags	611.60	
Lumber	364.14	
Blacksmithing	107.90	
Iron Work	232.96	
Freight and Cartage	158.04	
Filling	440.40	
Shed	797.97	
Tools and Equipment	542.65	
Road	381.00	
Miscellaneous	191.40	
		$ 6,501.31
		$ 9,512.05

It is expected that the ship wharf will be finished by March 31.

WHARF AT KAWAIHAE.

This wharf has been extended a few feet, raised and made wider.

The expenditures are:

Material	$ 290.53	
Labor	100.00	
Freight	103.92	
		$ 494.45

KIHEI WHARF.

A wharf has been built at Kihei, Maui, for the accommodation of the Kula district. The pier head is 32'x32' connected to the shore by an approach 10 ft. wide and 130 ft. long. The supports are concrete posts made by sinking old pontoon pipe into the sand and filling with concrete. The sand was scooped out from the inside of the pipe so that the concrete extends from 3 to 6 ft. into the sand bottom and there is no danger of being undermined by action of the waves. Considerable difficulty was encountered in sinking the pipe and the cost of the wharf exceeded the appropriation; but it makes a very satisfactory job inasmuch as there are no wooden piles to be eaten by the teredo.

The cost is distributed as follows:

Labor	$ 699.75
Lumber and Nails	312.75
Rock for Concrete	29.00
Tools and Equipment, Cartage, Bolts,	

etc.	40.50	
Hard Wood Mooring Posts.....	18.00	
		$ 1,100.00

In addition there was paid from Landings and Buoys Maui:

Cement . .....$	91.00	
Freight and Cartage.....	140.55	
Tools and Equipment.....	21.50	
Iron Work	67.57	
Car Wheels and R. R. Spikes.....	41.70	
Lumber	6.97	
		369.29
		$ 1,469.29

Besides this Wilder's S. S. Co. remitted freight charges amounting to $130.05 and furnished lumber $6.97. The same Company also furnished the track running from the warehouse onto the wharf. The warehouse is owned by Wilder's S. S. Co.

HARBOR IMPROVEMENTS HONOLULU.

The work done from this appropriation in 1896 was chiefly dredging on the Ewa side of the harbor and deepening a channel for the water of Nuuanu stream. In December, 1896, the dredger was started on Richards Street Slip, and made excellent progress in the upper layers of loose coral. The amount excavated during that month was 6380 cubic yards at a cost of 65 cents per yard.

By the end of January a distance of 150 ft. had been excavated for a width of 80 ft. to a depth for the first 50 ft. of 24 ft. then diminishing to 12 which was the depth carried for the last 50 ft. From this point to the head of the slip a distance of 250 ft. the depth to which it was possible to cut with the dredger diminished gradually to about 7 ft.

We have made considerable improvement in the capacity of dredger for working in rock by using specially made teeth on the cutter, but the work is very trying to the cutter and the ladder frame that carries it. It is only possible to carry on this heavy work by constantly overhauling and repairing the cutter.

To break up the lower and harder coral, a rotary steam drill has been put in operation and after blasting there is no difficulty in working down to the required depth with the dredger. Holes are drilled to a depth a little greater than the required excavation. These holes are 3 inches in diameter and are put down 4 or 5 ft. apart. A section of the head of the slip 70x80 ft. in area was drilled to a depth of 14 ft. from a temporary frame, and this section has been dredged out to a depth of about 12 ft. To get the full depth required, the drill has been mounted on a scow, which is held in position by a wire rope stretched across the slip. The scow is moved along this rope till a row of holes is completed, then the rope is shifted 5 ft. and another row is made. Usually each hole is blasted when finished, although a number of experiments have been tried blasting a number together.

A couple of dolphins or guards have been put in, one on each side of the Marine Railway, in 30 ft. of water, to pre-

vent the possibility of a deep vessel touching on the railway. Each dolphin consists of six piles well bolted together at the top, standing 10 ft. above the water.

Material has been purchased for a wharf to be constructed on one side of Richards Street Slip and for a wharf on the Ewa side of the harbor. The land of Akaukukui has been purchased from the Bishop Estate and the Gravier lot secured by exchange, so that work will begin at once on a wharf with a frontage of 240 ft. A 300 ft. berth also can be made from the end of this along the slip, of which the Nuuanu stream channel is an extension. Some dredging must be done to give these berths a depth sufficient for the larger vessels, but the material is gravel and mud and easily dredged.

One of the large items of expense in connection with the dredger has been the renewing of the discharge pipes. Both pontoon pipes and shore pipes were of No. 14 plate, rivetted in lengths of 33 ft. Within a year about 300 ft. of second hand cast iron pipe was purchased and laid in the discharge line, with results so satisfactory that 1000 ft. more have been purchased and this pipe has just been put into use in the work on Richards Street Slip. The first cost of the pipe is no more per foot than that of the steel pipe and the extra labor of handling is more than offset by the continued good condition of the pipe. The sand and coral that we are pumping will scour holes through a steel pipe in a few months, but the cast pipe will no doubt be good for as many years, not only on account of the thickness of metal, but because it rusts much less rapidly in salt water.

The expenditures under this appropriation may be classified as follows:

Youman's Slip and Stream Channel—		
Labor	$11,077.50	
Fuel	5,403.92	
Repairs	5,317.79	
Miscellaneous Expense, Oil, Waste, etc.	1,884.74	
Tools and Equipment	142.34	
Retaining Banks	748.65	
		$ 24,574.94
Richards Street Slip—		
Labor	$16,480.35	
Fuel	11,231.48	
Repairs to Dredger & Pontoons	8,875.83	
Rubber Connections	1,743.27	
Wire Rope	126.72	
Electric Light Installation	997.94	
Blasting	2,950.54	
Tools and Equipment	879.85	
Miscellaneous Expense	3,096.86	
		46,382.84
Discharge Pipe		3,145.55
Total Dredger Expense		$ 74,103.33
Wharf Material		11,717.42
Dolphins		874.74
Planting Grass Dumping Ground		46.95
Purchase of Akaukukui and lease		15,000.00
		$101,742.44

Since the first of August, 1896, the dredger has been kept in operation by night as well as by day, and the installation of an electrict plant on the dredger in April, 1897, has facilitated very much the night work, and probably has given the necessary light at an expense not much greater than that of the oil lamps used previously. The plant consists of an 80-light Marine Set. Between 40 and 50 lights are used ordinarily.

Through Mr. Marsden some Marram grass was imported and planted upon the sand pile which was pumped from the harbor bar, but the roots did not survive the voyage and none of it grew. Having failed in the experiment with grass some seeds of the convolvulus have been scattered over it and it is hoped that in time the vine will cover the surface and prevent the sand from being blown back into the channel.

The material dredged from the Ewa side of the harbor was pumped onto the old Chinese theatre lot and into the old stream channel above and below the old Smith's bridge. Considerable valuable land has been made in this way, some of which has been used to secure by way of exchange land required for River, Beretania and Kukui Streets extensions.

NEW ROADS.

Probably a greater length of new road has been constructed in the Republic during the past two years than during any other two years. A large proportion of it has been done by contract, and to the rapid methods and good judgment of the road engineer, Mr. W. W. Bruner,

are largely due the amount accomplished. It was his ambition to have a wagon road girdle the Island of Hawaii during the period, but the appropriations were not sufficient.

The lengths of new road constructed in the different districts are about as follows:

HAWAII.

	Miles.	Total Miles.
Hilo to Kaumana	5.25	
Kaiwiki Homesteads	1.	
Papaikou to Hakalau	9.	
		15.25
North Hilo—		
Honohina Section	2.	
Laupahoehoe	6.	
		8.
Hamakua Homesteads	5.25	5.25
Kohala—		
Kohala to Waimea	10.	
Mahukona to Puuhue	1.	
		11.
North Kona—		
Kailua Beach Road	.25	
Kailua road to Kohanaiki	1.65	
Kailua road to McGuire's	4.75	
Kailua road to Boundary S. Kona	12.35	
		19.

South Kona—

Completion Napoopoo road	1.57	
Boundary N. Kona to Napoopoo road	1.95	
Kealakekua to Kalahiki	8.82	
Kukuiopae to Papa, 10 ft. road	7.	
		19.34

Kau—

Hilea to Ninole Homesteads	2.05	
Pahala	.82	
		2.87
Trail Ninole Homesteads not included in mileage	4.05	

Puna—

12th mile to Kamaile	11.66	
Branch to Rycroft's road	5.20	
Cross road Olaa	1.	
		17.86
Total Hawaii		98.57

MAUI.

Makena to Kula	9.73	
Waiakoa Homesteads	2.97	
Completing Lahaina Maalaea	5.	
		17.70

OAHU.

Tantalus Road	.34	
Nuuanu Pali	1.44	

Waimanalo Branch	.61	
New grade Pukaki hill.....	.83	
New grade Waiawa.....	.38	
New grade Waimea.....	.31	
	——	3.91

KAUAI.

Lawai Kalaheo	1.	
Lawai Hoaea	3.	
	——	4.
Grand total		124.18

The extension of streets in Honolulu is not included in the above summary. A large portion of this work has been done by contract, but by no means all of it. The reconstruction of the main road in the Hilo district was carried on under the supervision of the Road Board until September, 1896, when the work was turned over to the Public Works Bureau. A gang of prisoners has been kept on the work constantly. At the beginning of the period the camp was at Onomea, in December, 1896, it was moved to Pepeekeo, and in July, 1897, it was moved again to Honohina where the prisoners are now working. Plantation labor was also employed both at Onomea and Hakalau, and at Laupahoehoe a gang of day laborers was started in November, 1896, and continued till October 1st, 1897, completing the road from Kiilau bridge through Laupahoehoe to Kaawalii gulch, making one of the finest sections of road on the Island.

The material was exceptionally good for top dressing and the work was thoroughly done. Some day work

was done on the Kaumana Road, and all of the work on the Kaiwiki Homestead road was by the day. In North Kona some work was done with day gangs near Holualoa under the supervision of Mr. Wait, the chairman of the Road Board. In South Kona the Napoopoo road begun in the last period, was completed to the landing and the same road extended three-fourths of a mile on the upper end. In Kau the change of grade at Pahala was done by day work.

The advantage of doing road work by contract is very great. We have accomplished more miles of road than would have been possible if we had attempted to do it all by day work, and no doubt the cost has been considerably less. Far less supervision is required and each contractor being interested in the completion of his own section does his own pushing.

The detail of road work done from the loan fund is as follows:

North Hilo—

Survey	$ 350.12	
Labor	13,068.20	
Tools and Equipment	651.55	
Powder, Fuse, etc	429.05	
Freight and Cartage	469.52	
Bridge and Culverts	628.46	
Miscellaneous	508.10	
Contracts	23,695.00	
		$39,800.00

The contractors for one of the sections near Laupahoehoe could not complete their contract on account of the

non removal of the tramway belonging to the plantation from the line of the road, and a deduction of $200.00 was made from the contract price. The tramway will be removed on the completion of the new plantation landing, and then the section can be completed.

Hilo.	Labo .	Material and Expense.	Total.	
Onomea Section..	$ 4,231 60	$1,753 32	$ 5,984 92	
Pepeekeo " ..	6,728 22	2,126 33	8,854 55	
Honomu " ..	17,278 15	2,818 08	17,096 23	
Hakalau " ..	5,935 49	226 21	6,161 70	
Waianuenue St ..	4,247 15	439 58	4,686 73	
Steel Bridges		.....	5,392 99	
Survey.....		.....	449 40	
Miscellaneous....		.....	1,373 48	
				$ 50,000.00

Five Steel Bridges were erected in this district.

Kawainui 78 feet span from San Francisco Bridge Co.

Kapaheehee 60 feet span from San Francisco Bridge Co.

Honomu 70 feet span from San Francisco Bridge Co.

Waiaea 70 feet span imported by Honolulu Iron Works Co.

Kapehu 70 feet span imported by Honolulu Iron Works Co.

Also a steel bridge of 70 feet span was included in the contract for the road through Kaawalii in North Hilo.

Hilo to Kaumana—		
Survey	$ 114.00	
Contract	9,800.00	
Labor and Expense	86.00	
		$ 10,000.00
Hilo to Kaiwiki Homesteads—		
Labor	$ 2,189.05	
Teams	200.82	
Bridge	505.88	
Tools and Expense	104.25	
		$ 3,000.00
Total Hilo		$ 63,000.00
Puna—		
Repairs to Volcano Road	$ 2,419.34	
Survey	101.63	
Tools and Equipment	197.30	
Contract	27,062.60	
Inspector	88.50	
Miscellaneous	31.50	
		$ 29,900.87
Cross Road Olaa—		
Survey	$ 26.45	
Advertising	25.15	
Contract	2,323.20	
		$ 2,374.80
		$ 32,275.67

Kohala to Waimea—			
Survey	$ 288.04		
Labor	1,495.77		
Fencing	773.95		
Contract	6,987.00		
Inspector	150.00		
Miscellaneous	187.03		
		$	9,881.79
Mahukona to Puuhue—			
Advertising	$ 18.50		
Contract	1,240.00		
		$	1,258.50
Total for Kohala		$	11,140.29
South Kona—			
Survey	$ 1,086.87		
Labor	10,115.81		
Tools and Equipment	496.14		
Teams	1,722.15		
Powder, &c	652.75		
Contract	25,058.00		
Inspector	200.00		
Fencing	316.20		
Miscellaneous	352.08		
		$	40,000.00
North Kona—			
Survey	$ 735.57		
Kailua Beach Road	1,469.00		

Labor	3,284.80	
Tools and Equipment	1,608.11	
Teams	293.50	
Powder, &c	176.35	
Contract	40,692.10	
Inspector	275.00	
Road Damages	1,037.50	
Miscellaneous	302.07	
		49,874.00

Kau—

Survey	$ 344.60	
Contracts	2,266.00	
Pahala Section	1,230.94	
Fencing	125.00	
Advertising	10.25	
		$ 3,976.79

Hamakua Homesteads—

Survey	$ 78.20	
Labor	1,130.00	
Contracts	5,493.00	
Culverts	36.00	
Powder, etc.	80.06	
Fencing	140.84	
Road Damages	35.90	
Advertising	6.00	
		7,000.00

HAWAII RECAPITULATION.

North Hilo	39,800.00	
Hilo	63,000.00	
Puna	32,275.67	
Kau	3,976.79	
South Kona	40,000.00	
North Kona	49,874.00	
Kohala	11,140.29	
Hamakua	7,000.00	
		247,066.75

MAUI.

Makena to Kula—

Survey	111.75	
Contract	9,888.25	
		10,000.00

Kula to Kihei—

Survey	$ 400.15	
Labor	694.00	
Powder and Freight	24.75	
		$ 1,118.90

A line was surveyed on a seven per cent. grade from the flat slope immediately back of Kihei to the Kula road, and the distance from the junction of the two roads was found to be two miles greater to Kihei than from the same point to Makena, to which port the new road has been completed on an easy grade; and as the corn

and potatoes are all raised at an elevation higher than that point I could not see the advantage to the shippers, of the longer road to Kihei, and no work was done on the line that had been staked. Later however I have been informed that the Kula farmers prefer shipping from Kihei and would like to have the road constructed.

Thinking the shippers from the opposite direction who are a long distance from the Makena road would be benefitted much more by a road to Kihei, a line was run and work was begun at the upper end, when we were informed that there was only one shipper who could use a road in that location and that shipper was well satisfied with present facilities, so work on the line was stopped at once.

$550.00 from the appropriation was spent in improving the lower portions of the road from Kihei.

New Roads Makawao Homesteads—

Survey	$ 154.50	
Contract	3,995.00	
Kaakaulua Bridge	314.38	
Fencing	1,300.87	
Road Damages	197.00	
Miscellaneous	38.25	
		$ 6,000.00

This road begins on the Kula road at the Kapukahawai bridge and runs up on an easy grade through the corn and potatoe lands nearly three miles to an elevation of 3960 ft. above the sea. It should be continued towards Makawao and carried down to connect again with the main road.

Lahaina to Wailuku—

Survey	$ 131.65	
Labor	7,682.72	
Camp	314.45	
Powder, etc.	786.95	
Tools and Equipment	282.87	
Teams	201.41	
Culverts	259.31	
Miscellaneous	205.92	
		$ 9,865.28

Work on the road was begun in December, 1896, and a prison gang has been kept on it most of the time besides the day laborers. It was used by teams even before it was entirely complete and is much appreciated.

Total for Maui..... $ 25,865.28

OAHU.

Nuuanu Pali Road—

Survey	$ 339.59	
Contract	37,500.00	
Steel Bridging	250.48	
Extra cutting and grading	1,558.05	
Inspector of Masonry	90.00	
Advertising	86.47	
		$ 39,824.59

It was impossible to get the required width for the road in the bend over the old spring without making a perpendicular cut of 80 ft. or hollowing under the cliff,

so the extra width was obtained by bridging the bend with steel girders and making a concrete floor on the "Columbian Fire proofing" system; which consists of ribbed bars laid from beam to beam on the lower flange and the whole space between the beams filled with concrete. The concrete is 8 inches thick and the ribbed bars running through it insure against breaking down under heavy loads. The paving of the road is continued over the concrete.

The laying out of the road was more than ordinarily difficult owing to the steepness of the slopes, and after the contractors had done the grading as staked it was found necessary to regrade a few hundred feet. Also in three places the sharp turns were relieved by cutting off the points.

NEW ROADS HONOLULU.

Tantalus Road		$ 1,832.49
Beach Road		5,257.04
Beretania St. Extension	$4,410.25	
Beretania St. Bridge	2,162.05	
		6,572.30
River St.	7,218.35	
Pauoa Stream Bridge	304.19	
		7,522.54
Vineyard St.		9,746.42
Kukui St. Bridge		312.20
College Walk		2,720.71
Pauahi St.		537.63
Achi Lane		385.92

Queen St. Extension.....	96.50	
Iolani St.	6.00	
Miscellaneous	10.25	
		$ 35,000.00

A considerable proportion of this work was done under the supervision of the Road Supervisor. The amounts expended by him were:

Tantalus Road .....$	1,832.40	
Beach Road	5,257.04	
Vineyard St. 7,925.69		
Pauahi St.	537.63	
Achi Lane	385.92	
Queen St. Extension.....	96.50	
Iolani St.	6.00	
		$ 16,041.27

The retaining walls along the stream on River Street and College Walk, were somewhat expensive as the excavation for foundations had to be made in the water and the stone was all brought by rail from the quarry.

NEW ROAD HALAWA STREAM TO THE TOP OF PUKAKI HILL.

A new grade has been made from the top of Pukaki hill to the bridge over Halawa Stream nowhere over 6 per cent. The length is 4400 ft.; 50 per cent. greater than the old grade. Cost.....$2,600.00

NEW ROADS KOLOA.....$ 4,000.00

This appropriation was spent under the supervision of

the chairman of the Koloa Road Board. A new road has been made through Lawai valley into Kalaheo, replacing steep grades with easy ones.

NEW ROAD MAUKA OF KOLOA FROM KAHOAEA TO LAWAI.

This is a wagon road to take the place of a horse trail much used by through travellers between Nawiliwili and the Makaweli side of the island. The expenditures were as follows:

Survey	$ 110.00	
Labor	2,899.95	
Teams	167.00	
Blacksmithing	32.25	
Bridges	473.34	
Prison Lunas	100.75	
Camp	166.30	
Freight, Powder, etc.	50.41	
		$ 4,000.00

This work was also done under the supervision of Mr. J. K. Farley, chairman of Koloa Road Board. There were a number of water ways to cross, and on these with their approaches was the largest part of the expense required. A small prison gang has been on this work a part of the time. The road is not entirely completed.

ROAD DAMAGES (LOAN).

The amounts expended under this Bureau for rights of way for new roads has been as follows:

Honolulu—			
Pauahi St.	$ 231.40		
River St.	4,944.58		
Beretania St.	465.00		
Aala Lane	3.25		
Queen St.	400.00		
Vineyard St.	2,784.80		
College Walk	310.86		
Kukui St.	175.00		
Richards St.	283.75		
Fort St.	73.22		
Mililani St.	92.19		
Kalihi Road	24.87		
		$9,788.92	
North Kona		1,130.72	
South Kona		937.70	
Kaumana Road		116.98	
Waianuenue St.		92.24	
Wailea, Hilo		242.00	
Laupahoehoe		100.00	
Hamakua Homesteads		177.00	
Makena Kula Road		311.40	
Lawai, Kauai		.95	
			$ 12,897.91

NUUANU STREAM IMPROVEMENTS.

The improvement of Nuuanu stream begun in last period was continued in this. The old channel has been straightened, cutting off the bend at the old Smith's bridge, a neat and substantial retaining wall has been

built on the town side of the stream from King street bridge to a point half way between Kukui and Vineyard streets, a distance of 1700 ft. and on the Ewa side from Beretania street to Kukui street 750 ft. The old Smith bridge has been put across the new channel at Kukui street, and a new bridge constructed at Beretania street the full width of the street. The floor of this bridge is covered with an asphalt paving 2 inch thick which makes an excellent roadway and will protect the plank from rain and consequent rot.

The excavation of the stream channel by hand was tedious work after the water level was reached, but the job was not large enough to justify the purchase of the machinery adapted for that work. The foundations of the retaining walls were laid in from two to three feet of water, with a good projection in front of the wall so there will be no liability to be undermined by the scouring of the stream. The stone was brought by rail from Kahauiki; a temporary track being laid so that the Railroad cars were dumped close to the work.

The distribution of the work is as follows:

Quarry and R. R. freight	$ 4,196.50	
Labor	12,890.37	
Tools and Equipment	369.60	
Teams	1,274.95	
Moving Houses	382.50	
Beretania St. bridge abutments..	312.50	
Miscellaneous	573.58	
		$20,000.00

WATER PIPE EXTENSION BERETANIA STREET.

4,440 ft. of 12″ cast iron pipe were purchased from the Oregon Iron and Steel Co. with connections, and laid by the Water Works Department in place of smaller pipe taken up. The appropriation was expended as follows:

Pipe	$ 5,659.15	
Connections and Fittings	382.28	
Lead and Packing	381.01	
Laying	1,353.40	
Carting and Piling	146.00	
Advertising and Exchange	78.16	
		$ 8,000.00

ADDITIONS TO WATER WORKS HONOLULU.

The roof over the Alapai Street Reservoir completed in December 1896, cost as follows:

Lumber	$ 417.94	
Bolts	174.25	
Roof Iron	1,053.79	
Labor	985.06	
Paint	33.75	
Cartage, &c	24.64	
		$ 2,689.43

ADDITIONS TO WATER WORKS HILO.

A considerable addition has been made to the water system of Hilo. An 8″ pipe has been laid from the or-

iginal water head, a distance of nearly 4,000 ft. to a spring which is very permanent and which discharges much more water than is needed at present for town purposes. Besides this 1,140 ft. of 4″ pipe and 4,320 ft. of 3″ pipe has been purchased and some of it laid where water service was most needed. The following is the detail of expenditure:

Pipe and Connections	$ 4,969.44	
Lead and Packing	239.90	
Cartage	274.95	
Water head and laying pipe.	1,481.27	
Right of Way	130.00	
Miscellaneous	102.67	
		$ 7,198.23

LIGHT HOUSE AND LIGHT DIAMOND HEAD.

The location selected for the Diamond Head Light is about 250 yards west of the Signal Station, on the bluff over looking the sea. The point selected is as far west as would allow the light to be seen from Koko Head point at sea level. An accurate location of the point to determine latitude and longitude will soon be made by the Survey Department.

Approximately it is in Lat. 21° 15′ 6″ N, and Long. 157° 48′ 22″ W. The elevation of the light above sea level will be 147 ft. It will be a fixed white light covering an arc of 184° with a red sector of 13° on either side. On the East side the red sector will begin to be visible at a point one-third of a mile South of Kawaihoa Point, or Koko Head and on the west side a mile and a half outside of the bell buoy.

The apparatus is a dioptric lens of the third order made by Messrs. Barbier and Benard of Paris, one meter in diameter enclosed in a lantern 3 meters in diameter, mounted on an iron tower. The tower will be an open frame, arranged to obstruct the view from the signal station as little as possible. An arc lamp connected with the city system of the Hawaiian Electric Co. can be used in this lens, and in the outfit furnished by Messrs. Barbier and Benard are two oil lamps to be used in case of any interruption of the electric circuit.

The light should be visible 20 miles.

The price of the apparatus f. o. b. Liverpool is £1,205 17s 8d Sterling. It was shipped on the ship "H. Hackfeld" from Liverpool about the middle of September.

The amounts expended from the appropriations are as follows:

Apparatus	$ 3,502.45	
Telegram	2.20	
Tower	151.35	
		$ 3,656.00

Only two-thirds of the purchase price of the apparatus has been paid. The construction of the tower is progressing at the Honolulu Iron Works.

LIGHT HOUSE AND LIGHT NAWILIWILI.

The site was secured by lease from the Lihue Plantation, and besides the light tower a small dwelling has been erected for the light keeper. The light is a Rochester burner with no lens, but with a reflector, throwing

the light directly to sea or towards the course of vessels coming from Oahu. The tower is an open wooden frame 40 ft. high surmounted by a lamp room painted white. It is located on Ninini point, north of the entrance to Nawiliwili bay, in Lat. 21° 57′ N., Long. 159° 20′ W. Elevation of light above sea level, 70 ft. and is visible 10 miles.

The amounts expended are:

Labor	$ 269.78	
Material	149.93	
Tank, &c	34.72	
Lamp	9.75	
Freight and Traveling Expenses	25.82	
Survey of site	10.00	
		$500.00

LIGHT HOUSE AND LIGHT KOHALA POINT.

The location of this light is on Kauhola point in Lat. 20° 15′ N., Long. 155° 46′ W. The tower is similar to that of Nawiliwili. The lamp is a "port lamp" made by Messrs Barbier and Benard of Paris, with a lens of seven elements, and reflector. Elevation above sea 65 ft. visible 10 miles. No keeper's house was constructed here but a store room was built within the tower.

The cost is as follows:

Tower	$ 457.32	
Apparatus	199.75	
Freight and Traveling Expenses	106.73	
		$763.80

LIGHT HOUSE AND LIGHT MAKAHANALOA.

The location of this light is a little north of the Pepeekeo landing. Lat. 19° 51′ N., Long. 155° 6′ W. Elevation above sea level 65 ft. visible 10 miles. The lamp and tower are the same as at Kohala point.

Cost		
Tower	$ 258.41	
Apparatus	199.75	
Freight and Traveling Expenses	52.03	
		$510.19

I must acknowledge the kind assistance of Mr. Deacon the manager of the Pepeekeo plantation in the erection of this light.

RECOMMENDATIONS.

NEW ROADS.

First and foremost the construction of new roads on the Island of Hawaii which has progressed so well during this period should be continued, until the different sections are connected and a wagon road is complete around the Island.

Mr. Bruner makes the following estimate of amounts required for this:

North Hilo, Kahuku to Papaloa	$ 35,000.00
Hamakua, new road to Waimea	10,000.00
S. Kohala and N. Kona, Waimea to Huehue	15,000.00
South Kona, Keei and Hookena	12,000.00

South Kona to Kau	10,000.00
Kau, South Kona to Waiohinu	12,000.00
Puna, Extension to Kaimu	10,000.00
4 trails over Hawaii	6,000.00
	$110,000.00

The last item while not involving a large amount of money would give a great convenience to horseback travelers who sometimes need to cross the Island of Hawaii in a hurry.

Besides the above sections there will be an urgent demand for additional roads in Olaa, not only to give access to lands already taken up but to open up new lands. To do the least that can be done and at the same time be the greatest benefit from the Government standpoint, I would recommend the construction of a cross road from about the 15th mile on the Volcano road, running back about two miles and from that point run a road in each direction parallel to the Volcano road say a combined distance of six miles. This would open a considerable tract of new land and at the same time be a great benefit to the owners or lessees of the back lots in the Olaa District. This plan will require $25,000.00.

Four times that amount can be spent in the Olaa District without fully satisfying the demand, and no doubt the investment would be profitable to the Government. The parallel road spoken of should eventually be extended to Hilo.

On Maui a road should be made from Nahiku landing to the homesteads, and from the homesteads to Hana.

The appropriation for a road from Kula to Kihei should be renewed and provision made for the extension of the Makawao homestead road.

On Oahu a macadamized road should be made up Nuuanu valley to connect with the fine road down the pali. Provision should also be made for an improved grade going towards Waimanalo from the branch of the pali road.

The district of Waialua also should have some assistance for a bridge at Lauhulu.

WATER WORKS.

Although the Sup't. of Water Works has probably laid before you the urgent need of increase and improvement in the system of water works for Honolulu, I will repeat what I have said in former reports that a reservoir at the Diamond Head end of the system and another at the right elevation in Kalihi will aid the service very much. A capacity for each of 150,000 cubic feet should be ample. This is a little more than three-fourths of the capacity of the Alapai St. reservoir. To complete the two and make pipe connections will require $34,000.

The pipe system of Hilo should be extended considerably to meet the necessities of the growing town.

HARBOR IMPROVEMENTS.

The plans already adopted for providing increased wharf room should be carried out. The steamer slip at foot of Richards Street should be completed during the coming period, with a wharf on each side of it. Also I

will urge the importance of acquiring more territory on the Ewa side of the harbor, and if possible the construction of at least two ships' berths on that side. This will require an appropriation of $125,000.

LANDINGS AND BUOYS.

The wharf at Hilo should be finished and a shed built over it.

A boat wharf is required at Hoopualoa in Kona, and the wharf at Hookena should be extended.

On Maui there is a demand for a boat landing at Nahiku.

The boat wharf at Kaunakakai, Molokai should also be constructed as soon as practicable.

BUILDINGS.

A building is required in Hilo to accommodate the Tax Assessor, and Agent of Public Lands. Also a building for Custom House which could include a Post Office.

A Circuit Court building in Kona can be provided by purchasing the Skating Rink at Kailua and making some alterations. A number of Jailors' houses are also required and some additions to cell room. It remains with the Legislature to decide whether separate appropriations will be made for these buildings or whether they will be provided for in the appropriation for Repairs and Additions to Government Buildings.

FIRE PROOF ROOM.

The necessity for a fire proof vault in the survey office has been mentioned more than once. The matter has been discussed with the Surveyor-General and the diffi-

culty of keeping the valuable maps in a vault is quite apparant, as they are required for daily reference, and the labor of stowing in a vault and taking out when required would be endless. The protection may be secured in great measure by making the room where most of the maps are kept practically fire proof, by substituting for the present floor one of concrete on iron beams, and making all of the map cases of non-inflammable wood. Double iron doors should also replace the wooden doors between this room and those adjoining. There is very little risk of fire coming through the outside windows as there are no buildings near.

LIGHTHOUSES.

The most important light required after the completion of that on Diamond Head is a light on Makapuu point, for the benefit of vessels approaching from the coast.

I will recommend a fixed white light of the third order similar to the one ordered for Diamond Head, mounted on a masonry tower. A keeper's house must also be provided. To cover all contingencies the appropriation should be $10,000.00.

I hope also the appropriation for Kahului Lighthouse will be renewed and increased to $7,000.

It will be a satisfaction to have an early decision by the Legislature as to what improvements may be provided for in order to have as much time as possible in which to plan and carry them out.

Respectfully submitted,

W. E. ROWELL,
Sup't. of Public Works.

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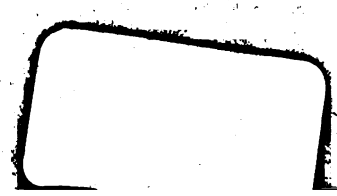

MINISTERS OF INTERIOR.

Dr. G. P. Judd	March 30, 1845 to March 4, 1846.
John Young 2nd	March 4, 1846 to June 6, 1857.
Lot Kamehameha	June 6, 1857 to December 24, 1863.
G. M. Robertson,	December 24, 1863 to February 18, 1864.
C. G. Hopkins	February 18, 1864, to April 26, 1865.
F. W. Hutchinson	April 26, 1865, to January 10, 1873.
E. O. Hall	January 10, 1873, to February 17, 1874.
H. A. Widemann	February 17, 1874 to October 31, 1874.
W. L. Moehonua	October 31, 1874 to December 5, 1876.
J. Mott Smith	December 5, 1876 to July 3, 1878.
S. G. Wilder	July 3, 1878 to August 14, 1880.
J. E. Bush	August 14, 1880 to September 27, 1880.
H. A. P. Carter	September 27, 1880 to May 20, 1882.
Simon K. Kaai	May 20, 1882 to August 8, 1882.
J. E. Bush	August 8, 1882 to July 26, 1883.
W. M. Gibson, *ad interim*,	July 26, 1883 to August 6, 1883.
C. T. Gulick	August 6, 1883 to June 30, 1886.
W. M. Gibson	June 30, 1886 to October 13, 1886.
L. Aholo	October 13, 1886 to July 1, 1887.
L. A. Thurston	July 1, 1887 to June 17, 1890.
C. N. Spencer	June 17, 1890 to September 12, 1892.
C. T. Gulick	September 12, 1892 to November 8, 1892.
Geo. N. Wilcox	November 8, 1892 to January 13, 1893.
Jno. F. Colburn	January 13, 1893 to January 17, 1893.
Jas. A. King	January 17, 1893.

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REPORT

OF THE

MINISTER OF THE INTERIOR

TO THE

PRESIDENT OF THE REPUBLIC OF HAWAII

FOR THE

YEAR ENDING DECEMBER 31, 1898.

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REPORT

OF THE

MINISTER OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,

Honolulu, December 31, 1898.

MR. PRESIDENT:

In accordance with the requirements of Section 1, Article 35 of the Constitution, I have the honor to submit a Report of the principal transactions of the Department of the Interior for the year ending December 31, 1898.

The Legislative appropriations for this Department, for the two years to end December 31, 1899, together with the disbursements and the balances at this date are summarized as follows:

SOURCE.	Total Appropriations.	Total Disbursed	Balance Dec. 31, 1898.
From Current Receipts	$1,696,207 84	$ 633,434 29	$1,062,773 55
From Loan Fund.....	1,349,307 28	111,270 91	1,238,036 37
	$3,045,515 12	$ 744,705 20	$2,300,809 92

ROAD TAX—SPECIAL DEPOSIT.

The Road Tax Balance Dec. 31, 1897, amounted to	$40,309 91	
Credit Receipts for 1898	86,342 00	
		$126,651 91
Amount drawn by the several Boards		99,008 70
Credit Balance Dec. 31, 1898.		$ 27,643 21

STATEMENT SHOWING THE AMOUNTS EXPENDED IN THE SEVERAL DISTRICTS FOR ROAD PURPOSES, FOR THE YEAR ENDING DECEMBER 31ST, 1898.

DISTRICT	ROAD TAX FUND	APPROPRIATIONS		TOTALS
		Roads and Bridges Current	Roads and Bridges Loan	
North Hilo	$ 4,219 40	$ 1,503 89	$ 200 00	5,923 29
Hilo	14,255 72	3,399 48	16 00	17,671 20
Puna	2,394 32	3,330 61	6 40	5,731 33
Kau	5,243 75	23 30	5,255 52	10,522 57
South Kona	2,634 10	80 50	117 00	2,831 60
North Kona	2,435 95	288 15	90 50	2,814 60
South Kohala	357 05	.....	362 00	719 05
North Kohala	5,636 05	145 00	.....	5,781 05
Hamakua	8,856 00	161 00	.....	9,017 00
Lahaina	2,434 88	50 00	.....	2,484 88
Wailuku	5,500 00	697 38	.....	6,197 38
Makawao	4,370 00	1,615 40	.....	5,985 40
Hana	2,904 00	1,408 18	224 50	4,536 68
Molokai	650 00	60 00	.....	710 00
Lanai	1 40	.....	.....	1 40
Honolulu	.....	69,074 04	145 86	69,219 90
Ewa & Waianae	8,799 66	574 55	.....	9,374 21
Waialua	2,204 55	882 57	.....	3,087 12
Koolauloa	1,550 95	39 50	.....	1,590 45
Koolaupoko	2,743 24	330 09	.....	3,073 33
Lihue	7,833 65	.....	.....	7,833 65
Koloa	2,242 85	1,894 58	30 00	4,167 43
Waimea	6,977 18	1,904 75	.....	8,881 93
Hanalei	2,364 00	220 00	.....	2,584 00
Kawaihau	2,400 00	.....	.....	2,400 00
Niihau	.....	.....	.....	.....

Receipts Interior Department for the Year 1898, as Compared With the Year 1897.

Receipts at Clerk's Office.	1897	1898	Increase.	Decrease.
Agents, Commercial	.....	500 00	500 00	.....
Agents, Labor Contract	100 00	100 00	.....	.....
Agents to take Acknowledgements	80 00	85 00	5 00	.....
Alcohol	100 00	250 00	150 00	.....
Auction	1,085 89	1,350 00	264 11	.....
Awa	2,427 00	3,941 30	1,514 30	.....
Banking	3,000 00	3,750 00	750 00	.....
Billiard	450 00	475 00	25 00	.....
Boat	120 00	288 00	168 00	.....
Boatman	30 00	98 00	68 00	.....
Butcher, Beef	1,580 00	1,320 00	.....	260 00
Butcher, Pork	1,540 00	1,610 00	70 00	.....
Cake Peddling	850 00	900 00	50 00	.....
Dray and Wagon	285 00	377 50	92 50	.....
Driver	392 00	437 00	45 00	.....
Drug, Poisonous	150 00	250 00	100 00	.....
Fire-arms, Hunting	100 00	70 00	.....	30 00
Fire-arms, to possess	220 00	183 00	.....	37 00
Hack	1,367 00	1,555 00	188 00	.....
Hotel and Restaurant	11,600 00	11,650 00	50 00	.....
Kerosene for fuel	.....	.....	.....	.....
Live Stock	.....	.....	.....	.....
Livery Stable	150 00	175 00	25 00	.....
Lodging Houses	276 00	186 00	.....	90 00
Merchandise	66,558 50	68,002 88	1,444 38	.....
Milk	1,125 00	512 50	.....	612 50
Notary Public	600 00	600 00	.....	.....

Receipts at Clerk's Office	1897	1898	Increase.	Decrease.
Physician	130 00	110 00	.....	20 00
Public Show	4,582 75	4,488 50	.....	94 25
Salmon	520 00	360 00	.....	160 00
Spirit (Wholesale	5,000 00	4,000 00	.....	1,000 00
Spirit (Dealers	4,000 00	4,000 00	.....	.....
Spirit (Retail	20,000 00	21,000 00	1,000 00	.....
Steam Laundry	.....	50 00	50 00	.....
Stock and Share	200 00	1,100 00	900 00	.....
Tobacco, Cigars and Cigarettes	5,800 00	6,440 00	640 00	.....
Wine, Beer and Ale	.....	2,400 00	2,400 00	.....
	$ 134,419 14	$ 142,614 68	$ 10,499 29	$ 2,303 75
Rents	48,197 12	43,436 37	.....	4,760 75
Sundry Government Realizations	5,140 90	5,113 89	.....	27 01
Laws, Sales of	357 00	355 50	.....	1 50
Land Office Fees	665 00	405 00	.....	260 00
Land Sales	53,558 20	5,963 75	.....	47,594 45
" " Interest	.....	336 50	336 50	.....
	$ 242,337 36	$ 198,225 69	$ 10,835 79	$ 54,947 46
Receipts of Various Bureaus:				
Water Works—				
Honolulu	61,969 30	69,564 20	7,594 90	.....
Hilo	2,649 10	3,672 00	1,022 90	.....
Laupahoehoe	90 50	115 50	25 00	.....
Koloa	130 00	140 00	10 00	.....
Market, Honolulu	9,025 00	9,189 25	164 25	.....
Registry of Conveyances	13,388 00	16,794 25	3,406 25	.....
Electric Light	924 45	958 20	33 75	.....
	$ 330,513 71	$ 298,659 09	$ 23,092 84	$ 54,947 46

From the above Comparative Statement it will be seen that there is a falling off in the total receipts at the Clerk's office of $44,111.67.

This is mostly accounted for by the largely increased receipts from Land Sales in 1897; the Hawaiian Hotel property was sold by the Government Oct. 1st of that year for $46,000, and with that sale an annual rental of $2,500 was taken from our rent roll. The decrease in receipts from land sales amounts to $47,594.45 and the decrease in rent receipts is $4,760.75.

Aside from these land transactions the Revenue of the Department makes a very satisfactory showing. The Receipts from License fees show an increase of $8,195.54, notwithstanding the fact that amendments in the Legislative Session of 1898 reduced some of the fees materially.

Two new classes of license have been established under the laws of 1898, viz: "Steam Laundry" and "Wine, Beer and Ale;" and one "Laundry" and twelve "Wine, Beer and Ale" licenses were issued during the year.

The receipts of the various Bureaus under this Department show a total increase of $12,257.05.

The following is a Comparative Statement of the Receipts of this Department and its Bureaus for five years:

1894	$253,727 20
1895	267,168 02
1896	251,926 36
1897	330,513 71
1898	298,659 09

The transfer of a large proportion of the Government

lands as well as a Rent Roll of over $40,000, to the custody of the Commissioners of Public Lands, accounted for the decrease of Receipts for 1896, and the Special sale of Government property for the large increase in 1897. In view of this, the total of $298,695 for 1898 is evidence of a very satisfactory and steady increase of the revenue in this Department.

The increase for the year of $7,594.90 from the Bureau of Water Works, Honolulu, and $3,406.25 from the Registry of Conveyances, contributed materially to this result.

The following is the Schedule of License fees as amended at the Legislative Session of 1898:

Agent	Commercial travelling, Oahu.	$ 500 00
	Commercial travelling, each other Island	250 00
	Labor Contract, Honolulu ..	50 00
	Other districts not required To take acknowledgements, Honolulu	10 00
	Oahu, other than Honolulu	5 00
	Each other Judicial Circuit	5 00
Alcohol		50 00
Auctioneer	Honolulu	600 00
	Each other District	15 00
Awa	Upset price at Auction, Honolulu	1,000 00
	Hilo	500 00
	Wailuku	500 00
	Lahaina	250 00
	Each other District	100 00

Banking		750 00
Billiard	Each table	25 00
Boat	Honolulu, Lahaina, Hilo or Kahului, 4 or more oars	8 00
	Less than 4 oars	4 00
Boatman	Honolulu	1 00
Bowling	Each Alley	25 00
Butcher, Beef.	To slaughter and sell, Honolulu	100 00
	Each other District	20 00
	To sell only, Each District	10 00
Butcher, Pork.	To slaughter and sell, Honolulu	40 00
	Each other District	20 00
	To sell only, each District	10 00
Cake Peddling	Each Island	25 00
Dray, Wagon, etc.	For Freight — Honolulu, Wailuku, Lahaina or Hilo	2 50
Driver	Of Licensed Vehicle	1 00
Drugs—Poisonous		50 00
Fire-Arm	Hunting	5 00
	To own or possess	1 00
Hack	Carrying Capacity—for each Person	1 00
Hotel	Boarding House or Restaurant	50 00
Kerosene (for fuel)	Outside the limits of Honolulu	10 00
Live Stock		200 00
Livery Stable	Honolulu	50 00
	Wailuku	25 00
	Hilo	25 00
Lodging House		2 00

Merchandise	When gross Annual sales are less than $20,000	50 00
	When $20,000 or over, ⅜ per cent. on Gross Sales	
Milk		2 50
Notary Public .	Honolulu	10 00
	Each other Judicial Circuit	5 00
Physician		10 00
Public Show ...	Each Performance	5 00
Salmon		10 00
Spirit	Wholesale	500 00
	Dealers	500 00
	Retail	1,000 00
Steam Laundry..	Honolulu (District of Kona).	50 00
Stock and Share Broker		100 00
Tobacco, Cigars and Cigarettes		10 00
Wine	Manufactured from Grapes of Hawaiian Growth (no fee)	
Wine, Beer and Ale		200 00

In addition to the license fees as above, the rates of Stamp tax are as follows:

On Licenses of a $20.00 fee or under	$ 50
On Licenses over $20.00 to $50.00	1 00
On Licenses over $50.00 to $100.00	2 00
On Licenses over $100.00, for every $50.00, or fractional part thereof	1 00

NATIONALITY OF LICENSE HOLDERS, COMPARATIVE STATEMENT FOR TWO YEARS.

LICENSE.	CHINESE		JAPANESE		PORTUGUESE		ALL OTHER	
	1897	1898	1897	1898	1897	1898	1897	1898
Agent–Commercial Traveller								1
Agent—Labor Contract							2	2
" Acknowledgem'nts						1	16	14
Alcohol							2	5
Auction							7	12
Awa	5	10					3	6
Banking			1	2			3	3
Billiard	1	2	2	3	1	2	10	8
Boat	2	3			3		23	64
Boatman	1			2			29	96
Bowling Alley								
Butcher—Beef	29	20	2	1	5	5	39	45
" Pork	66	68	3	3			5	14
Cake Peddling	23	26	11	10				
Dray and Wagon	25	24	9	23	13	8	67	96
Driver	82	95	54	72	60	73	196	197
Drug—Poisonous							3	5
Fire Arm—Hunting					1	1	19	13
Hack	70	75	44	63	27	26	97	94
Hotel and Restaurant	172	169	37	34	1		22	30
Kerosene for Fuel								
Live Stock								
Livery Stable					2	2	3	4
Lodging House	82	57	12	7	1	2	43	26
Merchandise	507	509	120	126	47	50	222	226
Milk	2	1	25	16	48	45	36	44
Notary Public					2	2	86	89
Physician							13	11
Public Show	166	167	17	1	1	3	73	80
Salmon	11	11			2	2	38	23
Spirit—Wholesale	3	3	1	1	1		5	4
" Dealers			1	1	1	1	6	6
" Retail	2	2			1	3	16	16
Steam Laundry								1
Stock and Share							2	11
Tobacco, Cigar and Cigarette	374	401	70	87	32	37	104	118
Wine, Beer and Ale		2		1		2		7
Total	1623	1478	392	452	248	262	1104	1281

In the total footings as above shown, Physician and Public Show Licenses are not included.

The License to a Physician holds good during his residence in the Islands and the License for Theatre or other Public Show is at a fixed fee for each exhibition and frequently the same party or Manager for convenience sake, is granted a license for a series of performances.

The Licenses to own or possess fire arms is omitted from the above statement, for the reason that a separate license is issued for each fire-arm and it frequently happens that several licenses are issued to one individual.

DETAILED STATEMENT OF GOVERNMENT REALIZATIONS —RECEIPTS OF INTERIOR DEPARTMENT FOR THE YEAR ENDING DECEMBER 31, 1898.

FEES—

Building Permits	$ 546 00
Candidate for Senator	25 00
Certificates, verifying documents	6 00
Certificates in re publications	11 00
Charters, recording of..	428 30
Dis-incorporation	30 00
Patents of Invention, Caveats, Copy-rights, Labels and Trade Marks	150 00
Permission to Assign, Transfer or Mortgage Government Lease	20 00

Registry of Co-partnerships	130 00
Registry of Women Trading in their own names	1 00
Sales—	
Buildings, Lumber, etc., old	817 58
Fence Posts, Judiciary fence	79 97
Manure soil, sand, etc.	889 37
Old iron and copper	10 50
Sundry old material	125 30
Sundry—	
Gunpowder Storage	208 92
Hawaiian Electric Co., 2½% on Gross Rec'pts	1,052 75
Steam Roller, Carts, etc., use of	18 00
Rollers, Jack-screws, etc., use of	45 30
Return of Duplicate Payments, etc.	60 00
	$4,654 99

DEPARTMENT LAND TRANSACTIONS.

Sales of Government Land under the control of the Minister of the Interior:

There has been but two sales of land under this Department for the year ending December 31st, 1898, and Fee Simple Titles issued as follows:

Date of Sale.	Purchaser.	Location	Area	Purchase Price.
Feb. 8, 1898	H. C. Meyers.....	Kaluaopalena, Kalihi, Oahu	.295 Acres	$ 340 00
May 23, 1898	T. H. Davies	S. Slope Punchbowl, Honolulu, Oahu.....	48,132 sq. ft.	2,270 00
				$ 2,610 00
During the year we have received on account of Sales on Time Payments, Punchbowl and Tantalus Lots, and from land in exchange for Road Purposes....				3,353 75
Total Receipts From Land Sales.....				$ 5,963 75

Patents issued during the year as follows:

On Homesteads	78
" Olaa Reservation	36
" Puukapu Reservation	2
" Time payment..	20
" Cash purchase	14
" Exchanges	4
" Equitable settlement	2
" Perfecting title	1
" Land Commission award	13
" Agreement of sale	1
	171

Fees amounting to $405.00 have been received from this source.

The classed statement above shows that the number of Patents issued during the year was 171. The number issued for the year 1897 was 107. Showing an increase of 64.

LAND PATENT RECORDS.

The clerk who has charge of this work, also has the making out of Land Patents, a work requiring time and care, and for which there has been an increased demand, necessarily taking a great deal of his time from the copying of records.

Since the commencement of this work, November, 1896, Volumes 1 and 2 have been completed and Volume 3 is progressing as rapidly as the interrupted requirements for other duties will permit.

The number of Patents copied during the year was 201 with a total of 428 folios.

CONVEYANCES.

In addition to the large number of Patent Grants shown as above, 74 Deeds of Conveyance have been drawn and executed by this Department during the year for the settlement of Road Claims and for sundry other Government purposes.

LEASES.

During the year the following new Government Leases have been made:

No. of Lease.	Lessee.	Location.	Date of Lease.	Term.	Annual Rent
532	Sorenson & Lyle	Marine Railway.	Jan. 1, '98	15 yrs.	$ 4,000
533	Honolulu Iron Works Co.	Lot Marine St.	Jan. 19, '98	4 " 1.⅓mo	150
534*	H. Hackfeld & Co	Lot 21 Esplanade	Mar. 23, '98	30 yrs.	300
535°	Brewer & Co.	Lot and Building Queen St	Sept. 1, '98	20 "	1,200
536†	J. G. Serrao	Lot 19 Block B, Hilo, Hawaii.	Dec. 12, '98	21 "	635
537*	E. O. Hall & Son.	Lot 18 Esplanade	Dec. 19, '98	30 "	360
	Total				$ 6,645

*Conditioned under Act 7, Laws of 1896.
°Conditioned to make $8,000 improvement.
†Conditioned to build a Market Building.

The following Government Leases have expired or have been cancelled during the year:

No. of Lease.	Lessee.	Location.	Remarks.
158	U. S. Government	Coal Space	Cancelled
335	Sorenson & Lyle.	Marine Railway	"
379	Oahu Railway & Land Co	Fish Pond, Kuwili	Expired
380	C. Brewer & Co..	Lower floor, Armory, Queen St	"
486	J. H. Bruns	Lot 15 Esplanade	Cancelled
489	C. Brewer & Co..	Upper floor, Armory, Queen St	Expired
24	Caroline H. Brown	Lot 140 Kapiolani Park	Cancelled
25	"	Lot 141 Kapiolani Park	"
27	Ida K. Von Holt	Lot 143 Kapiolani Park	"
50	"	Lot 142 Kapiolani Park	"
102	A. Gartenberg	Lot 133 Kapiolani Park	"
103	"	Lot 134 Kapiolani Park	"
529	Yee See Kong	Lot Corner Vineyard and Emma Sts	"
....	F. M. Swanzy	Lot Makiki	"

The Annual Rental of the above amounted to $6,590 00

HAWAIIAN CORPORATIONS.

Forty Corporations for Mercantile, Manufacturing, or Agricultural purposes, and one Hospital filed their Articles of Association during the year just ended; eight Corporations have amended their Charters and four have been dissolved.

207 Mercantile, Manufacturing or Agricultural Corporations are now in existence as shown by the Records in this Department. Of this number 103 were entered under the Act of 1890.

CHARTERS TO CORPORATIONS FOR MERCANTILE, AGRICULTURAL AND MANUFACTURING PURPOSES, ISSUED DURING THE YEAR 1898.

Name of Corporation.	Date of Filing.	Term of Years	Capital Stock.	No of Shares	Per Value
Benson, Smith & Co	Jan. 4, '98	50	$ 35,000 00	350	$ 100 00
Koloa Agri'l. Co .	Jan. 27, '98	50	60,000 00	600	100 00
Molokai Ranch Co	Feb. 4, '98	50	168,000 00	1.680	100 00
Judd Building Co	Feb. 5, '98	50	100,000 00	1,000	100 00
Hustace & Co....	Feb. 7, '98	50	60,000 00	600	100 00
Star Dairy Co	Feb. 10, '98	50	10,000 00	1,000	10 00
N. S. Sachs Dry Goods Co	Feb. 18, '98	50	60,000 00	600	100 00
Chinese Coffee Co	Feb. 19, '98	25	25,000 00	250	100 00
Hilo Drug Co	Feb. 23, '98	..	10,000 00	100	100 00
E. Peck & Co.....	Feb. 26, '98	50	90,000 00	900	100 00
Hawaiian Fibre Co	Mar. 4, '98	50	25,000 00	250	100 00
Bergstrom Music Co	Apr. 4. '98	50	20,000 00	200	100 00
S. N. Castle Estate	Apr. 1, '98	50	600,000 00	6,000	100 00
Oahu Market Co..	May 2, '98	50	50,000 00	500	100 00
W. W. Dimond & Co	May 10, '98	50	70,000 00	3,500	20 00
Volcano Stable and Transportation Co	May 12, '98	50	75,000 00	750	100 00
Palama Co-operative Grocery Co.	June 20, '98	50	6,000 00	240	25 00
Hawaiian Fruit and Plant Co...	July 20, '98	50	25,000 00	250	100 00
Honolulu Steam Laundry Co....	July 20, '98	50	25,000 00	250	100 00
American Sugar Co	July 26, '98	50	1,500,000 00	15,000	100 00
Kekaha Sugar Co	July 26, '98	50	600,000 00	6,000	100 00
Hawaii Soda Works Co.....	Aug. 10, '98	50	3,000 00	30	100 00
Hawaiian Trust and Investiment Co	Aug. 10, '98	50	30,000 00	300	100 00

CHARTERS TO CORPORATIONS FOR MERCANTILE, AGRICULTURAL AND MANUFACTURING PURPOSES, ISSUED DURING THE YEAR 1898.

Name of Corporation.	Date of Filing	Term of Years	Capital Stock	No. of Shares	Per Value
Honolulu Rapid Transit and Land Co	Aug. 30, '98	50	$ 200,000 00	2,000	$ 100 00
Sandwich Islands Honey Co	Sept. 29, '98	50	160,000 00	1,600	100 00
Klondyke Mineral Prospecting Proprietory Syndicate	Oct. 6, '98	50	10,000 00	100	100 00
Waialua Agricultural Co	Oct. 12, '98	50	3,500,000 00	35,000	100 00
Hawaiian Trading Co	Oct. 10, '98	50	50,000 00	2,000	25 00
McBryde Estate	Oct. 19, '98	50	60,000 00	6	10,000 00
Union Express Co.	Oct. 31, '98	50	12,000 00	120	100 00
Manufacturer's Sho Co	Oct. 31, '98	50	60,000 00	600	100 00
Honolulu Brewing and Malting Co	Oct. 17, '98	50	200,000 00	2,000	100 00
Hawaiian National Co	Oct. 24, '98	25	5,000 00	500	10 00
Huelo Sugar Mill Co	Nov. 18, '98	50	40,000 00	400	100 00
James I. Dowsett Estate	Nov. 22, '98	50	180,000 00	6	30,000 00
Kilauea Coffee Co.	Nov. 22, '98	50	70,000 00	700	100 00
Hawaiian Fertilizer Co	Nov. 23, '98	50	200,000 00	2,000	100 00
Charles Brewer Estate	Nov. 24, '98	50	150,000 00	1,500	100 00
Kona Sugar Co	Dec. 5, '98	50	500,000 00	5,000	100 00
Catton, Neill & Co.	Dec. 5, '98	50	75,000 00	750	100 00

CHARTERED FOR BENEVOLENT PURPOSES.

September 8, 1898. Lihue Hospital

CHARTERS AMENDED.

DATE.	CORPORATION.	
Feb. 16, 1898	Koloa Agricultural Co.....	Locating Principal Office at Koloa, Kauai
April 22, 1898	Koloa Sugar Co.	Increasing Capital Stock to $200,000 divided into two thousand shares of $100 each, with privilege to increase the Capital to $500,000.
May 6, 1898	Ookala Sugar Plantation Co.	Privilege to increase Capital not to exceed $750,000.
May 21, 1898	Pacific Sugar Mill	Privilege to increase the Capital not to exceed $750,000.
July 9, 1898	Hawaiian Agricultural Co....	Term of Corporate existence extended from 30 to 50 years and Privilege to increase Capital, not to exceed $1,000,000.
Aug. 29, 1898	Honokaa Sugar Co.....	Capital stock increased to $1,000,000.
Sept. 1, 1898	Union Feed Co...	Term of Corporate existence extended from 25 to 50 years. Privilege to increase Capital not to exceed $500,000.
Oct. 25, 1898	Kilauea Sugar Co.	Capital Stock increased to $1,500,000.

CORPORATIONS DISSOLVED.

May 9, 1898. Hawaiian Construction Company.
July 18, 1898. Waihee Sugar Company.
September 2, 1898. Hawaiian Coffee & Tea Company.
October 8, 1898. Molokai Ranch Company.

IMPORTATION AND INSPECTION OF LIVE STOCK FOR THE YEAR ENDING DECEMBER 31, 1898.

Port of Arrival	From	Stallions.	Mares	Geldings.	Jacks	Mules	Bulls	Cows	Swine	Sheep	Dogs
Honolulu	San Francisco	6	75	203	....	630	18	74	3,916	79	7
"	Eureka, Cal	....	....	....	....	....	....	....	88	....	....
Total at Honolulu		6	75	203	....	630	18	74	4,004	79	7
Hilo	San Francisco	1	28	119	...	218	20	16	114	....	2
"	Eureka, Cal	....	2	1	....	....	....	....	....	....	....
"	Washington	....	2	1	....	....	....	....	....	....	....
Mahukona & Honoipu	S. San Francisco	....	1	1	....	46	....	....	....	....	....
Kahului	S. San Francisco	....	12	1	....	....	4	1	20	....	1
Total at all Ports		7	120	326	....	894	42	91	4,138	79	10

Appended hereto, I beg to submit the Reports of the several Bureaus of this Department as follows:

Bureau of Survey.
Bureau of Public Works.
Bureau of Water Works.
Clerk of the Market.
Board of Fire Commissioners.
Supervisor of Honolulu Roads.
Bureau of Conveyances.
Bureau of Agriculture and Forestry.
Commissioner of Patents.

As there are frequent calls for information and statistics relating more particularly to the matter of labor supply, I have deemed it advisable to publish the Report of the Bureau of Immigration under separate cover.

I have the honor to be, sir,

Your obedient servant,

J. A. KING,
Minister of the Interior.

To SANFORD B. DOLE,
President of the Republic of Hawaii.

Report of the Surveyor General

FOR THE

YEAR ENDING DECEMBER 31, 1898.

TO J. A. KING,
Minister of the Interior.

SIR:—I have the honor to submit to you the following report of the Bureau of Government Surveying for the year ending December 31, 1898.

During the first part of the year, before the passage of the Appropriation Bills by the Legislature, strict economy was observed and the field work on the other islands was nearly suspended. During its last session, the Legislature enlarged the sphere of this Bureau by placing the survey of Public Lands, including Homestead lots, leases, &c, under its charge. As will be seen, special attention has been paid to this latter branch of our work.

HAWAII.

TRIGONOMETRICAL SURVEY OF KAU.

The trigonometrical survey of the island of Hawaii was taken up again in the latter part of August by Mr. J. S.

Emerson, in the District of Kau, and has been carried on by him with untiring zeal and painstaking accuracy. Landing at Punaluu August 21st, he proceeded to Puna, where he engaged his trusty veteran, Keanaha, after which they visited fifteen stations, including a new one at Haao, between the volcano and Ka Lae or South Point, setting signals wherever they were needed.

He then occupied in turn a series of stations along the wind-swept coast of Kau from Lae o Kamilo to the South Point, with the 12-inch theodolite. Returning inland, he occupied the "Ahu a Umi," four miles due north of the Point, and then the lofty summit of Akihi, nine miles farther up the slope of Mauna Loa, and east of the source of the lava flow of 1887. The 12-inch theodolite was carried up and down that steep hill by the herculean Keanaha alone. Next the Kipaepae station on the shore below Naalehu was occupied through a heavy rain storm.

Between the 20th and 27th of November, Mr. Emerson made a laborious reconnoisance on the S. E. side of Mauna Loa, north of Ainapo, where he selected a new station called Keapoomuku, which completes the network of trig. stations for eastern Hawaii, at an elevation of 8,000 or 9,000 feet, and built a first class signal on the spot. It commands a view of nearly every survey station from Kulani hill and Kapoho in Puna around to Puu Enuhe in Punaluu. The 1st of December found Mr. Emerson at work at Kamehame, on the shore three miles east of Punaluu, after which he was prostrated by illness for several days, probably in conseqence of overwork and exposure.

The continued rainy and foggy weather prevented him

from occupying the lofty summit of Mt. Kaiholena, but he succeeded in making complete sets of observations at Haao station, and on Kapuna Hill east of Waiohinu, before the close of December. His next move was expected to be to Puu Enuhe, north of Punaluu.

The measurements of angles made during this campaign have been surprisingly accurate under the circumstances, the closing error of each triangle, as observed, rarely exceeding 4″. The accounts of the party have also shown a strict regard for economy.

DISTRICT OF HILO.

During the spring of 1898, Mr. E. D. Baldwin was employed in surveying extensions and widenings as well as grades of streets in the town of Hilo. On the 9th of August this office was notified that it was the desire of the Executive Council that the section of ten or fifteen thousand acres lying to the westward of the present surveyed Olaa tract, be surveyed and subdivided into Homestead lots.

The first steps in this survey were necessarily, 1st, the opening of a cross road through the present Olaa section, and 2d, the survey of a new main road about 3½ miles to the westward of the Volcano Road, and approximately parallel to it, for a distance of 8 or 10 miles, on each side of which a series of 50 acre lots were to be laid out, and their corners permanently marked. Mr. E. D. Baldwin, from his long familiarity with the section, which he originally surveyed, was selected to supervise the work.

A cross road starting at the 15½ mile on the Volcano Road, was first surveyed and graded, which involved

heavy cutting through the forest, in almost incessant rain. In this work Mr. Thos. E. Cook deserves mention for faithful and efficient service.

On the 25th of September a consultation was held with the Land Commission and the Superintendent of Public Works in regard to the best location of the upper trunk line of road, and of the cross roads, for which a general plan was laid out. In order to expedite the work, Mr. J. H. Moragne, one of the U. S. Volunteer Engineers, who was then granted a two months' furlough, and has since been granted a discharge, was engaged in the service of this Bureau Sept. 26th. On the following day, I left with him for Olaa, to inspect the land and the system of survey, returning Oct. 9th. Mr. Moragne has proved himself to be a hard-working and reliable surveyor, having had much previous experience in pioneer work.

On the 1st of November Mr. Baldwin furnished a plan of the Olaa tract, showing the proposed location of the roads, and the division of the lots in the new section, besides the profile and specifications for three miles of the road. This new section contains 20,650 acres of fertile land, at present covered with forest, which will make about 400 lots, allowing for roads. The lots, as planned by Mr. Baldwin are 2,899.2 feet deep by 751¼ feet wide on the main road, while the tiers of lots in the rear of these, have a frontage of 724.8 feet on the cross roads, and a depth of 3,005 feet, making the distance between the cross roads 6,010 feet. The average grade of these roads is less than 3 per cent. The width of the main road is 60 feet, and that of the cross roads 50 feet. The construction of the above road was begun in December.

Since then both the new main road and the side roads have been completely surveyed and marked, and the survey of the 50-acre lots is now in progress.

DISTRICTS OF HAMAKUA AND KOHALA.

The following tracts, situated in the Districts of Hamakua and Kohala, were selected by the Commissioners of Public Lands in September last, for subdivision into lots:

1. A tract of forest land, in North Hilo, lying above the section already disposed of, and known as the Waikaumalo, Ninole and Maulua lots, for a Settlement Association.

2. A tract of Government land, lying between the Maulua and Laupahoehoe gulches, and above the line of the lease to the Laupahoehoe Sugar Co., containing probably several thousand acres.

3. The Kamoku and Kapulena tracts, in west Hamakua, lying between the lands of Kapoaula and Waikoekoe, and above the various grants already made on the lower portions of these tracts.

4. A tract of Government land in Kaauhuhu and Kahei, Kohala.

The services of Mr. A. B. Lobenstein having been engaged Sept. 23 he immediately commenced the survey of the tract first mentioned above, laying out 17 lots of 100 acres apiece, as well as the necessary roads connected with the same, which occupied him till about Nov. 20th.

Since then he has completed the field work of the survey and subdivision of the Kaauhuhu tract in Kohala.

Mr. C. V. E. Dove was employed during the month of November and 23 days in December in surveying roads in Hamakua, near Pauuilo and above Pohakea and Kalopa, besides a few Homestead lots in that section.

DISTRICT OF KONA.

In the District of North Kona, Hawaii, are two tracts of Government land known as Ooma mauka, 1,160 acres, and Honaula, 5,400 acres, both of which are under leases, but with a reservation by which the Government may take up any portion of them suitable for settlement.

Accordingly, Mr. S. M. Kanakanui and Mr. C. J. Willis were sent to North Kona Oct. 11th, with instructions to survey and subdivide the upper portions of these lands, and also of Kealakehe, above the lines of previous grants, but not to carry the survey higher than 3,000 feet above sea level. The lands in question are covered with a dense forest similar to that of Olaa. About 2,500 acres have been laid out in 50-acre lots, and the work of running out and cutting the division lines is now (Jan. 1) approaching completion.

ISLAND OF MAUI.

In the District of Koolau, Maui, there is considerable Government land, which will be available for agricultural purposes, as soon as passable roads are opened through it.

Mr. Hugh Howell was employed during May and part of June in surveying lands in Nahiku and Keanae for the Government. On the 21st of September he again entered

the Government service, and during the first part of October surveyed the Keanae flat, Napihaa's homestead, and a road leading up from the Keanae landing to the crossing of the Kukuipahu stream.

Since then he has been engaged in completing the subdivision of the Nahiku lands, and of the roads connecting them with the landing and also with the Government road. This work has been much hindered by frequent rains. It is expected that the upper boundary of the land of Ulaino will now be determined and surveyed. Since Nov. 1st Mr. Dart has been employed in road work in the Nahiku section.

ISLAND OF OAHU.

During the month of September Mr. Dove surveyed certain Government remnants in Waiahole, Koolau, for the Land Commission. The Government remainder at Wahiawa, Waialua, was laid out for a Settlement Association by Mr. M. D. Monsarrat.

Several city blocks in Honolulu have been re-surveyed in detail, and large scale plans of them drawn on a scale of 20 feet to the inch, showing all buildings and fences, with the present titles of all real estate holdings, as well as the original Awards and Grants and subsequent conveyances. In the early part of the year, Mr. J. S. Emerson made an exhaustive survey of that portion of the city above Beretania street, between Nuuanu street on one side and Miller and Punchbowl streets on the other. Mr. Sorenson was employed to make a similar survey of the block below Queen street, lying between Richards

and Punchbowl streets. It seems to be unnecessary to give the details of the numerous surveys of the street lines and grades, of proposed improvements, &c., during the past year.

STATISTICS OF OFFICE WORK.

The nature of the routine work of this office has been sufficiently explained in former reports. The number of maps registered to date is 1,939. The number of copies of surveys furnished is 900. During the past year the following documents have been furnished:

Tracings furnished	65
Reports upon applications for Public Lands	46
Miscellaneous letters and reports	146
Copies of surveys furnished	97
Estimates furnished	15
Plans and tracings filed	24
Chronometers rated	22

(This last item includes a number rated for U. S. national vessels, for which no charge was made.

METEOROLOGY, &C.

The regular work of the Weather Service has been kept up during the year. Mr. C. J. Lyons has fortunately so far recovered his health as to be able to take charge of this service since the 1st of August.

The meteorological observations of the years 1896 and 1897 were arranged, tabulated and prepared for publication during the first part of the year, with the assistance

of Miss Emma C. Lyons, and an edition of 500 copies of the report was published last August. Tidal observations have been continued with our self-registering tide-gauge. The standard time has been obtained from transit observations and furnished to the public, as well as the Greenwich time for navigators. The map of Molokai, engraved by Julius Bien & Co. in New York, came to hand Jan. 22d, and is quite satisfactory.

CHANGES OF PERSONNEL.

It is with deep regret that I record the loss which this Government has sustained in the withdrawal of Mr. F. S. Dodge, the Chief Assistant in this Bureau, which dates from October 1st, 1898.

His services to the Government have been invaluable, while his example and influence have helped to elevate the standard of service in this Bureau. Mr. W. E. Wall has been promoted to fill the vacancy created by Mr. Dodge's retirement, while Mr. O. Sorenson has been appointed Second Assistant, and Messrs. David B. Lyman and Geo. F. Wright have been assigned to subordinate positions in our staff.

PLANS FOR THE COMING YEAR.

It is of the first importance to push the survey and subdivision of such public lands as are available for settlement, as much as possible.

As has been stated before, a new map of Oahu, brought up to date, is called for, as well as a larger map of Ha-

waii, on a scale of 1:120,000 or 10,000 to the inch, which will contain fuller details than the present map.

The Superintendent of the U. S. Coast & Geodetic Survey proposes to extend its operations to this Territory at an early date. The work of making a trigonometrical survey of Kauai and Niihau, and that of making an accurate geodetic connection between the islands of Hawaii and Maui, will no doubt be executed under the auspices of that Bureau. That class of work, however, of which there is the most immediate need, is the hydrographic survey of the most important harbors and bays of the islands. A surveying vessel will probably be dispatched here in a few months, to enter upon this line of work. The Superintendent proposes to establish a sub-office in Honolulu similar to that maintained in San Francisco. It is expected that a division of the personnel and material of the present survey will be made between the U. S. Coast & Geodetic Survey and the local survey of this Territory. Such an arrangement will no doubt promote the general efficiency and accuracy of the work.

The Director of the U. S. Geological Survey also proposes to commence the geological survey of these islands at an early date, basing his topographical maps upon our triangulation.

I have the honor to remain,

Your obedient servant,

W. D. Alexander,
Surveyor-General.

REPORT

OF THE

Superintendent of Water Works.

HONOLULU, H. I., December 31, 1898.

J. A. KING, Minister of the Interior:

SIR:—I have the honor of presenting my report as Superintendent of the Bureau of Water Works, Honolulu, for the twelve (12) months ending December 31, 1898.

APPROPRIATIONS AND EXPENDITURES.

Running Expenses.

Appropriated	$ 7,500 00	
Expended	3,056 64	
Balance		$ 4,443 36

Running Expenses, Pumping Plants.

Appropriated	$25,000 00	
Expended	10,564 44	
Balance		$14,435 56

General Repairs.

Appropriated	$12,000 00	
Expended	3,156 37	
Balance		$ 8,843 63

Repairs to Reservoirs.

Appropriated	$ 8,000 00	
Expended	2,286 16	
Balance		$ 5,713 84

Kalihi Pumping Plant (Loan).

Appropriated	$60,000 00	
Expended		
Balance		$60,000 00

Additions to Water Works, Honolulu, Additions to Pipe System (Loan).

Appropriated	$65,000 00	
Expended	4 00	
Balance		$64,996 00

Reservoir, Diamond Head (Loan).

Appropriated	$20,000 00	
Expended		
Balance		$20,000 00

DETAIL OF EXPENDITURES.

	Run. Expen. H W. W.	Run. Expen. Pump Plts.	General Repairs.	Repairs to Resr.	Add. to Pipe Sys. (Loan)	Totals.
Labor	$ 34 00	$ 3,395 50	$ 2,269 25	$ 1,967 90		$ 7,666 65
Horse Feed	458 51					458 51
Horse Shoeing	101 25					101 25
Horse Medicine	44 50					44 50
Harness and Rep.	25 65					25 65
Vehicles and "	195 75					195 75
Tools and Repairs	281 95	97 58	15 25	27 08		421 86
Machine and "		193 28				193 28
Lights and "		71 60	4 65			76 25
Pipe and Fittings	516 31		786 47			1,302 78
Paint and Oil	3 00	5 45		10 60		19 05
Mac. Oil Waste	4 35	121 38				125 73
Hardware	3 70		50	57 17		61 37
Freight, Haul'g	13 00		80 25	17 50		110 75
Cement and Lime				46 00		46 00
Lumber				149 91		149 91
Rent of Lands	500 00					500 00
Rent Telephone	306 00					306 00
Printing	211 70					211 70
Advertising	239 99				$ 4 00	243 99
Stationary	21 40					21 40
Fuel		6,675 00				6,675 00
Sundries	95 58	4 65		10 00		110 23
Totals	$ 3,056 64	$ 10,564 44	$ 3,156 37	$ 2,286 16	$ 4 00	$ 19,067 61

REVENUE OF THE BUREAU.

The receipts of the Bureau during the year of 1898 were $69,564.20, the same having been received from the following sources:

Water furnished to Shipping	$13,741 70	
Receipts for tapping (labor and material)	812 25	
Back periods, water rates	1,166 95	
" " 10% Penalty	112 20	
Current period, delinquent rates..	7,310 10	
" " 10% penalty	726 65	
" " rates pd. in adv'ce	45,694 35	
Total		$69,564 20

INCREASE OF PRIVILEGES.

One hundred and forty-three (143) Privileges have been added to the system during 1898.

They are rated as follows:

2	at	$ 5 00	per	annum
58	"	15 00	"	"
9	"	20 00	"	"
33	"	25 00	"	"
7	"	30 00	"	"
1	"	32 00	"	"
10	"	35 00	"	"
5	"	40 00	"	"
2	"	45 00	"	"
10	"	50 00	"	"
1	"	65 00	"	"

1	"	.. ..	$70 00	per	annum
2	"	....	75 00	"	"
1	"	.. ..	90 00	"	"
1	"	.. ..	100 00	"	"

WORK PERFORMED DURING THE YEAR.

(1250) Twelve hundred and fifty feet of 2″ galvanized pipe has been laid on Makee Road, Waikiki.

(1,000) One thousand feet of 2″ galvanized pipe has been laid on Kewalo street between Wilder avenue and Lunalilo street.

(350) Three hundred and fifty feet of 2″ galvanized pipe has been laid on Iwilei Road, near the slaughter houses.

The mains have been lowered to suit the change of grade on Manoa Road, Pensacola. Kapiolani and Metcalf streets.

I have had a great deal of repair work during the year but expect the new mains in a few days, and will have them laid as soon as possible and the old ones taken up. Those that are good will be cleaned and relaid where they will be of the most service.

The reservoirs have been cleaned twice during the year. The freshets of last March washed away part of the banks of Nos. 1 and 2 which were repaired, and new strainers added, and they are at present in good repair. Freshets also washed away the Makiki dam, which has been rebuilt and is at present in good shape.

The springs above and below Luakaha have all been thoroughly cleaned.

The keepers' houses have had their annual overhauling, and are now in good repair.

PUMPING.

During the year it has been necessary to pump 1,296,322,960 gallons of water, with a consumption of 875 tons of coal.

The Beretania street pumps have been running at their full capacity, and the Makiki pump has furnished about 40,000,000 gallons of water during the year.

The demand for water is increasing every day and the supply is getting less.

The pumps need overhauling but will have to wait until we get some rain, which I hope will be soon.

The Makiki pump has been overhauled and boilers repaired and at present is in good order.

Respectfully submitted,

ANDREW BROWN,
Supt. Honolulu Water Works.

REPORT

OF THE

CLERK OF THE MARKET.

HONOLULU, December 31st, 1898.

J. A. KING, Minister of the Interior.

SIR:—I have the honor to submit herewith my report as Clerk of the Market, for the twelve (12) months, ending December 31st, 1898.

APPROPRIATIONS AND EXPENDITURES.

Running Expenses, Market.

Appropriated	$1,000 00	
Expended	79 43	
Balance		$920 57

DETAIL OF EXPENDITURES.

Tools and repairs	$ 8 90	
Lights and repairs	5 40	
Plumbing	59 13	
Printing	6 00	
Total		$79 43

REVENUE.

The receipts from the Market for the twelve (12) months have been as follows:

Monthly rent from Stalls	$8,707 00	
Transient rent from Stalls ...	482 25	
Total		$9,189 25

Respectfully submitted,

ANDREW BROWN,
Clerk of Market.

REPORT

OF THE

ROAD SUPERVISOR,

HONOLULU, December 31st, 1898.

JAMES A. KING, ESQ.,
Minister of the Interior.

SIR:—I beg to submit herewith my report of work done on the Honolulu roads for (12) twelve months ending December 31, 1898.

The statement shows in detail the amounts expended on each street or road for construction, repairs, culverts and bridge work. Appended to this is a statement of the purchase and repairs of crushing and rolling machinery, live stock, wagons, and carts and implements required for road work.

Statement showing expenditures by Bureau of Honolulu Roads for (12) twelve months ending December 31, 1898.

Distributed as follows:

	Labor.	Material.	Total
Alapai Street.			
Construction . . .	$ 58 30	$	$
Repairs	34 05	50	92 85
Alakea Street.			
Culverts	8 35	14 76	
Crossings		16 90	
Repairs	40 10		
Sidewalks	1 95		82 06
Asylum Road.			
Repairs (R. & B.).	85 45		85 45
Alexander Street.			
Repairs	89 35		89 35
Aala Road.			
R. & B.—repairs . .	99 78		
Special approp. enlarging, etc. .	233 90	266 10	599 78
Adams Lane.			
Repairs	3 50		3 50
Artesian Street.			
Repairs	111 05	1 25	112 30

	Labor.	Material.	Total
Achi Lane.			
Repairs	4 20		4 20
Beach Road.			
Culverts	40 20	50 64	
Repairs	23 65		114 49
Beckley Street.			
Construction . . .	345 48		
Repairs	127 62		473 10
Beretania Street.			
Bridge repairs . .	158 57	83 98	
Culverts	30 40	64 00	
Crossings		6 76	
Repairs	356 05	2 00	701 76
Bates Street.			
Culverts	4 50	11 52	
Repairs	119 73	9 80	145 55
Bethel Street.			
Repairs	4 25		4 25
Bingham Street.			
Repairs	79 16		79 16

	Labor.	Material.	Total
Beckwith Street.			
Construction . . .	190 09		
Repairs	22 15		212 24
Dole Street.			
Repairs	53 58		
Weeding	7 48		61 06
Diamond Head Road.			
Construction . . .	53 25		
Repairs	32 20		85 45
Emma Street.			
Crossings	15 65	16 12	
Repairs	1 55	4 27	
Sidewalk	7 55		45 14
Esplanade Lot.			
Dump	83 85		83 85
Exec. Bldg. Grounds.			
Walks and r'dway	9 10		9 10
Fort Street.			
Crossings	19 65	45 51	
Culverts	5 50		
Repairs	227 23	35 80	
Sidewalk	35		334 04

	Labor.	Material.	Total.
Green Street.			
Repairs	18 60		18 60
Hackfeld Street.			
Fence repairs . . .	3 00		
Quarry	362 58		
Repairs	63 02		
Weeding	11 97		440 57
Hotel Street.			
Crossings	6 30		
Repairs	67 93		74 23
Halekauila Street.			
Repairs	17 47		17 47
Hassinger Street.			
Repairs	18 45		18 45
Houghtailing Lane.			
R. & B. repairs . .	75 20		
Spec. appr. for rep.	220 50	79 50	375 20
Iwilei Road.			
Bridge repairs . .	4 05	18 02	
Repairs	56 75		78 80

	Labor.	Material.	Total.
Judd Street.			
Culverts	14 20	21 16	
Repairs	267 14		302 50
Judiciary Bldg. Gr'ds.			
Sidewalk	4 55		4 55
Kamoiliili Road.			
Quarry	5,898 61	1,796 49	
Repairs to mach'y		318 47	
Railroad track . .	126 30	127 00	8,266 87
Kinau Street.			
Repairs	310 41	5 75	316 16
King Street.			
Crossings	23 68	55 90	
Culverts	21 65	98 40	
Bridge repairs . . .	17 30	9 12	
Repairs	745 45	30 20	
Sidewalk	4 10		
Widen'g (Ref. Sch.)	62 03	13 19	1,081 02
Kahauiki Road.			
Repairs	1 00		1 00
Keaumoku Street.			
Construction	575 77	62 35	
Repairs	76 85		714 97

	Labor.	Material.	Total.
Kamehameha Road.			
Quarry	497 10		
Repairs	55 00		552 10
Kalihi Road.			
Quarry	41 35	175 00	
Repairs	1,034 82	62 20	1,313 37
Kapiolani Street.			
Construction . . .	629 89	53 15	
Culverts		14 82	
Repairs	14 50		
Weeding	17 61		729 97
Kewalo Street.			
Ditch	10 72		
Repairs	24 32		
Weeding	7 35		42 39
Kakaako Road.			
Repairs	5 70		5 70
Kawaiahao Lane.			
Repairs	55 65	14 59	70 24
Kukui Street.			
Repairs	37 05		
Sidewalk	75		37 80

	Labor.	Material.	Total
Kekaulike Street.			
Repairs	5 35		5 35
Kuakini Street.			
Repairs	54 87		54 87
Kapahulu Road.			
Repairs	9 75		9 75
Kaluaopalena Streets.			
R. & B. repairs . . .	251 33	3 04	
Spec. ap. macad sts	583 30	339 12	1,176 79
Liliha Street.			
Repairs	214 91		214 91
Likelike Street.			
Repairs	1 00		1 00
Lunalilo Street.			
Repairs	297 40	77 42	374 82
(Kalia) Lower Waikiki Road.			
Repairs	6 25		6 25
Magazine Street..			
Repairs	9 09	11 50	20 59

	Labor.	Material.	Total.
Moanalua Road.			
Culverts	3 00	7 00	
Repairs	403 94		413 94
Moanalua to Kapukaki.			
Spec. ap. macad rd.	190 25		190 25
Makiki Street.			
Bridge repair . . .	3 00	17 09	
Ditch	386 01	93 50	
Repairs	23 06		
Weeding	2 31		524 97
Manoa Road.			
Bridge repair	61 93	161 66	
Construction	5,653 15	280 56	
Culverts	5 76	9 12	6,172 18
Maunakea Street.			
Repairs	40 60		40 60
Merchant Street.			
Crossing		6 76	
Repairs	10 10		16 86
Miller Street.			
Repairs	56 24		56 24

	Labor.	Material.	Total.
Metcalf Street.			
Repairs	27 70		27 70
Imp'v. Nuuanu Str'm.			
R. & B. construc'n.	8 02		
Spec. ap. imp. st'm	2,454 55	439 94	2,902 51
Nuuanu Street.			
Crossings	7 85	6 50	
Culverts	2 75	2 55	
Repairs	2,409 45	101 77	
Bridge repair	179 03	78 18	2,788 08
Nuuanu Pali Road.			
Bridge repairs . . .	16 10	80 44	
Repairs	375 41		471 95
Prospect Street.			
Repairs	30		30
Pensacola Street.			
Construction	2,190 30	14 65	2,204 95
Piikoi Street.			
Repairs	120 14		
Weeding	2 31		122 45

	Labor.	Material.	Total.
Punchbowl Street.			
Ditch	136 33		
Repairs	30 55		166 88
Punchbowl Drive.			
Repairs	19 35		19 35
Punahou Street.			
Construction	431 78	2 75	
Repairs	322 21	50	
Sidewalk	11 77		
Weeding	15 22		784 23
Pauoa Road.			
Bridge repairs . . .	6 00	23 80	
Culverts	11 50	22 00	
Repairs	16 20		79 50
Pauahi Street.			
Repairs	23 95		23 95
Queen Street.			
Crossings		6 50	
Repairs	203 97	5 00	215 47
Quarry Street.			
Repairs	64 76		64 76

	Labor.	Material.	Total.
Richards Street.			
Repairs	14 05		
Sidewalk	2 00		16 05
River Street.			
R. & B. Culverts . .	6 37		
" repairs . .	231 76	12 00	
Spec. ap. macad St.	2,460 31	539 69	3,250 13
South Street.			
Repairs	5 95		5 95
Sheridan Street.			
Culverts	1 25	17 50	
Repairs	206 86	14 20	239 81
Smith Street.			
Repairs	30 90		30 90
Spencer Avenue.			
Repairs	384 93	10 24	395 17
School Street.			
Bridge repairs . . .	1 50	13 61	
Repairs	13 55		28 66

	Labor.	Material.	Total.
Tantalus Road.			
Repairs	248 43		248 43
Thurston Avenue.			
Repairs	13 16		13 16
Union Street.			
R. & B. repairs . . .	5 35		
Special appropriation for macad..	435 65	1,747 26	2,188 26
Ululani Street.			
Repairs	8 67		8 67
Vineyard Street.			
Crossings		9 35	
Repairs	145 60	31 30	186 25
Victoria Street.			
Construction	556 27	40 60	
Repairs	18 00		614 87
Waialae Road.			
R. & B. repairs . . .	473 19		473 19
Wilder Avenue.			
Repairs	156 82		156 82

	Labor.	Material.	Total.
Waikiki Road.			
Bridge repairs . . .	200 43	265 77	
Repairs	110 67		576 87
Wyllie Street.			
R. & B. repairs . . .	21 10		
Spec. appr. repairs	165 95	234 05	421 10
Wards Ditch.			
Repairs	59 59		59 59
Young Street.			
Repairs	32 60		32 60
Total, "Street acct.".	$37,666 43	$ 8,312 14	$45,978 57

Recapitulation List.

Bridges repairs	$ 647 91	$ 751 67	
Constructions	10,692 30	454 06	
Culverts	155 43	333 47	
Crossings	73 13	170 30	
Ditches	533 06	93 50	
Dump	83 85		
Fence repairs	3 00		
Quarries	6,799 64	1,971 49	
R. & B. repairs	11,639 00	751 80	
Spec. appro. repairs .	620 35	579 65	

	Labor.	Material.	Total.
Sidewalks	42 12		
Track Kamoiliili R'd	126 30	127 00	
Weeding streets	64 25		
King Street widening (Refor. School) .	62 03	13 19	
Spec'l Appro'ations.			
River Street	2,460 31	539 69	
Union Street	435 65	1,747 26	
Impr. Nuuanu Str'm.	2,454 55	439 94	
Streets Kaluaopalena	583 30	339 12	
Moanalua to Kapukaki	190 25		
	$37,666 43	$ 8,312 14	$45,978 57

SUNDRY ACCOUNTS.

	Labor.	Material.	Total
Crusher Engine Kamo'l.			
Repairs	$ 3 20	$ 372 58	$ 375 78
Cleaning streets.			
Sweep'g & patch'g	3,679 13		
Rent, Dump Carts,		12 00	3,691 13
Carts and Wagons.			
New		498 00	
Repairs		1,657 20	2,155 20

	Labor.	Material.	Total.
Cars (Tram).			
Repairs		64 80	64 80
Harness.			
Repairs	275 10	378 86	653 96
Horse & Mule Acct.			
Feed		9,988 50	
Shoeing		876 44	
Medical attendance		60 99	10,925 93
Live Stock.			
Gr. horse		125 00	125 00
Office Expense.			
Stationery, telp., & advertising		400 80	400 80
Portable Crusher.			
Putting together & Fr'g, Brewer & Co.	85 67	1,129 45	
Repairs, fuel, etc. .		299 15	1,514 27
Powder & Fuse Acct.			
Used on streets & roads		1,119 09	1,119 09

	Labor.	Material.	Total.
Steam Rollers.			
Repairs	132 62	436 88	
Fuel		863 60	
Oil		228 04	
Waste		72 04	1,733 18
Shops.			
Repairs	232 19		232 19
Stables and Yard.			
Stablemen	1,830 81		
Telephone, Lub'etc.		132 56	1,963 37
Sprinkling Streets.			
Drivers	943 59		
Rent, water cart . .		55 00	
Repairs		179 12	1,177 71
Tools & Implements.			
New.		738 60	
Repairs	670 08		1,408 68
Total Street & Sundry Accounts . . .	$44,848 74	$28,670 92	$73,519 66

Realizations collected by this Bureau and turned in to the Treasury Department, from January 1st, 1898, to December 31, 1898, $1,519.20.

Number of days prison labor (exclusive of lunas), from January 1st, 1898, to December 31st, 1898, 26,003.

I have the honor to be

Your obedient servant,

W. H. CUMMINGS,
Road Supervisor. Honolulu.

REPORT

OF THE

REGISTRAR OF CONVEYANCES.

BUREAU OF CONVEYANCES, Dec. 31, 1898.

JAMES A. KING, ESQ.,
Minister of the Interior.

SIR:—In presenting the customary report of this Bureau it is a satisfaction to report another year of continued activity largely exceeding the estimate. For the latter half of the year this condition has called for the services of extra help beyond the new copyist provided for by the last Legislature, pay for which extra service has of necessity been arranged by apportionment from the amount provided for "five copyists." It is hoped this will carry us through the remainder of the period without further serious delays to the public, for there have been several times in this past year when papers were ten days or more ahead of us, despite our best effort to hasten all work.

The following table of monthly receipts of the office, classified according to the customary divisions thereof,

shows more tangible evidence of this growth of office work.

Months.	Rec. Fees.	Cert. Cop	Cop. R.P.	Ack.	Search	Total.
January ...	$ 1,234.50	$ 29.50	25.50	....	....	$ 1,289.50
February	1,371.50	67.50	25.50	..	.....	1,464.50
March	1,064.00	37.00	36.00	..	1.00	1,138.00
April	1,193.00	14.00	9.50	.	10.00	1,226.50
May	1,399.50	23.00	30.00	1.00	.....	1,453.50
June.....	1,395.00	52.00	23.50	4.00	.....	1,474.50
July	1,107.50	31.50	12.50	1.25	....	1,152.75
August.....	1,414.00	45.00	46.50	....	....	1,505.50
September ...	1,541.00	32.00	34.00	1.00	.....	1,608.00
October	1,547.00	37.50	29.00	1.00	.....	1,614.50
November....	1,439.50	21.00	3.50	1.00	.....	1,465.00
December	1,351.00	24.50	24.50	2.00	.....	1,402.00
Totals for 1898	$16,057.50	$ 414.50	$ 300.00	$11.25	$11.00	$16,794.25

The receipts for 1897 were $13,388; the above table shows, therefore, the gain of $3,406.25 for the past year. The number of recorded instruments for the year have been 5,486 as against 4,400 in 1897, an increase of 1,086.

This long strain of continuous instruments has rendered it necessary for one, my Deputy, to devote his whole time to indexing current work and the preparation of the quarterly abstract sheets for the Assessors, and yet help has to be assigned him from time to time so as to keep this branch of the work as well up as conditions will allow. The frequent interruptions to indexing by parties calling for the indices for reference, especially during the rush days, so hampers the work that little progress is made at such times, yet the very ones most responsible are those disposed to complain at

being inconvenienced by the work being in arrear and ask for their being up to the copyists daily.

This millenium condition may be attained next year, providing appropriation is made for a night clerical force.

Anxiety for the care of the records of the office from the conditions shown in my last report, continues, and shows the desirability of some legal enactment, by license or otherwise, for some restrictions upon this wholesale injury by alleged searchers of records, many of whom look upon the office and its conveniences as theirs by right, and the force of copyists as servants to facilitate their special work rather than that of the general public. This is shown so plainly in their confirmed habit of calling for records and indices without looking to see if they are not already at their hand, as is more frequently the case than not.

It is becoming more and more apparent that a system must be adopted to facilitate the finding of books withdrawn from the vaults. The counter space will not now suffice to stand them in convenient consecutive number order, nor would the "dear public" replace them if a special shelf or ledge was constructed for the books along the front wall of the room. Most of the damage is being done by the piling up of books and indices one on another, and the attendant rough handling in finding what may be wanted. I have devoted much thought to the subject. While the increased demands upon the office would seem to call for more room to accommodate the public, I fear this would tend to increase rather than modify the means of injury. It would seem as if a system of revolving book stands, to carry the records of

the office in three rows or tiers to each stand, might be devised to solve the problem by having a sufficient number (five) constructed to carry the necessary size and weight. These revolving stands could be run out of the vault on tracks laid therefor toward the end of the room in front of the counter, for convenience of reference and use during the day, and would be run back into the vault at the close of each day's business. It may require a special attendant to see that people replace the books in their proper respective places, and also to see that no damage to, or tampering with, the records was done. In fact with the growing work and increasing indices—a new set of which will be started with the year 1900—the necessity of a front attendant is becoming necessary not only for the suitable care of property, but for better attendance upon the public demands without distracting the copyists and interfering with them in their more important service. At present the office is unable to engage any one for such duty. Should the activity of the past few years be continued it is hoped future provision for the public convenience of the office and care of its records will have due consideration.

Respectfully submitted,

THOS. G. THRUM,
Registrar of Conveyances.

REPORT

OF THE

COMMISSIONER OF AGRICULTURE.

HONOLULU, H. I., Dec. 31, 1898.

JAMES A. KING, ESQ.,
Minister of the Interior.

SIR:—I beg leave to submit the following report of the transactions of the Bureau of Agriculture, as Commissioner and Secretary of the Board, dating from May 14th, 1898, at which date the position was tendered me upon the resignation of Mr. Marsden, my predecessor.

On May 14th the Board passed a resolution providing for monthly meetings which have been regularly held on the first Friday of each month since; these meetings have been well attended by the members, giving their time from business hours, freely; which I believe is fully appreciated by such of the public as are interested in the agricultural development of the islands, and who should not be? where, practically, all of our national wealth is based upon the returns from the soil. At a

special meeting of the Board, held May 27th, it was voted that Prof. Koebele be granted six months leave of absence to visit the United States and Mexico, to collect parasites for the cut-worm, caterpillar, horn-fly, fluke, etc. He started on his trip the first of June, returning the first week of December. During this period he forwarded to this Bureau numerous collections of insects which I bred and liberated according to his instructions, and I believe much good will eventually come from this work, as has been the case in the past. Prof. Koebele will give details of the work accomplished, in his report. There is much interest manifested on the islands in the work he is doing so effectively, and it is to be hoped that his service may be retained indefinitely, with our extending commercial relations, we are also increasing our chances for the importation and dissemination of various insect and fungus pests; these will be distributed more rapidly in the future than has been the case in the past, on account of greater facilities for intercourse between remote portions of the islands, brought about by the rapid development that will take place from this time forward, and it behooves us to avail ourselves of the best practical scientific knowledge possible. Scientific knowledge and the practical application of it are not always to be found in one person, and when such a one has been tried and *not* found wanting, we should hold fast to his services.

The Board has passed a rule prohibiting the importation of soil, on account of the danger of importing the larvae of numerous insects hibernating therein. It was in this way that the Japanese beetle was imported. Your Commissioner, acting as inspector for the Port of Honolulu has caused all plants coming in with soil on the

roots to be carefully examined, the soil removed and destroyed when there was any likelihood of danger; also notices have been sent to the principal points of shipment on the mainland and Australia, and served on the shipping agencies of Honolulu that all plants, to be received into the islands, must be packed in moss, or otherwise without soil; with the result that few plants are now received with soil on their roots.

The tabu on the shipment of plants from one island to another of the group has been removed. This regulation prevented the other islands sharing in the benefits derived from the Government Nursery, and accomplished no special good.

There is serious apprehension on the Island of Hawaii, by the coffee planters, that diseases affecting that industry may be imported, now that they have direct communication with the mainland. I am in receipt of a communication from Dr. N. Russel, President of the Olaa Coffee Growers' Association, asking that some action be taken to provide that island with the service of a competent scientific person, whose time could be devoted *wholly* to the work. It appears to me that their request is founded on conditions that should receive careful consideration, and I would respectfully recommend that means be provided at an early date as possible for complying with their very reasonable request, for the industry of coffee growing has been held forth as promising good returns, and every safeguard that will result in the full realization of the greatest possibilities, should be extended to this industry while it is in its infancy.

Your Commissioner regrets to report that little headway has been made toward an exhibition of island pro-

ducts. It seems difficult to get the people who have fruit and other products growing, sufficiently interested to supply contributions for the purpose, and my time, since entering upon the duties of the office, has been so largely taken up with an extensive correspondence, incident to the attention directed to the islands by annexation, that I have not been able to make collections personally; however, now that I have been supplied with a clerk I will be able to engage in more outside work, including the collecting of suitable samples of products for such an exhibit. I have commenced the work in a preparatory way, and shall be able to give the subject more attention henceforth, and hope the plan will result in much good to the islands by enabling visitors and others to become familiar with the agricultural products.

As stated above, the amount of correspondence received by this Bureau during the past five months threatened to convert this Department into an "information bureau;" not only has the correspondence from those seeking information from abroad increased, but the local letter list has been greatly augmented by a desire on the part of planters for information pertaining to their various pursuits. By reference to the letter book I find there have been three times as many letters written during the past six months as during the preceding six months, which will give some idea of the work involved, especially when very many from our own people asked for technical information that required, in many instances, resort to text books, and often, foreign correspondence as well to obtain the information desired.

The awakening interest in all that pertains to soil

culture, must be gratifying to those who have the development of our agricultural resources at heart; especially, as in some instances, this desire for information comes from native Hawaiians. There is imperative need of Agricultural Training Schools and Experiment Stations, and it is to be hoped that the work in this direction may soon commence. The effort in this line inaugurated in the public schools, is to be commended and should receive every encouragement possible. The services of this Bureau have been extended, wherever it has been practicable to render aid.

The Board has often expressed the opinion that the planting of shade trees along the public highways should be undertaken by this Bureau, and be encouraged in private parties; the work of preparing trees for planting is now going on, but there is poor encouragement in the country districts for planting shade trees along the public highways when stockmen are permitted to use them for pasturing their animals. Some steps should be taken to abate the nuisance; if there is no adequate law on the statute books, this defect should be remedied at the first session of the Legislature. It is useless to expect either the natural or artificially planted forest trees along roadsides or on the plains, to exist with the present pastoral conditions, and it is surprising to me that any observing person will defend live stock roaming at will in the forests, against the accusation of their destructive work, which is so evident on all hands. One defender in the public press says in effect, "See those large dead forest trees? Cattle did not kill them; they died of old age or other causes." This is very likely as true of the forest tree as of the human family, but why, I would ask him,

are there no young forest trees to take their place? Anyone knows that the young seedlings, trampled and browsed by droves of cattle never can thrive, for this is Nature's only way of perpetuating her groves, and unless means are taken to prevent this destructive work going on it will only be a question of time, till the mountain slopes will be as bare of trees as are the plains, which once were heavily clothed with timber, but from which the forest has gradually receded before the resistless destruction of the pastoral industry. I do not wish to be understood as waging war on any industry, but rather to incite to higher and more advanced methods of stock raising. The days of the pastoral industry are past on the mainland except in out-of-the-way places, or on the great plains. Twenty years ago the same conditions as to stock raising existed in portions of the Pacific Coast, where it took from five to ten acres to carry a scrub cow or bullock through the year, and when a dry year came they died by the thousands. Today, on the same land, the modern up-to-date farmer will keep two head of high grade or thoroughbred stock on one acre, and with irrigation, has no fear of the dry year; and the income from one of these cows is more per annum than from five of such as are commonly seen on these islands. Yet the natural conditions are more favorable here than on the mainland for producing feed, and bringing about the same favorable conditions as exist there at the present time. There is no valid reason, from a profit standpoint, why the present destructive methods should continue.

From the report of Mr. David Haughs, in charge of the Government Gardens and the Nuuanu and Makiki forests, I am enabled to make the following showing of

work accomplished by the Forest and Nursery Department:

"Plants and trees distributed by months, for 1898:

January	1,512
February	797
March	462
April	950
May	1,930
June	1,299
July	2,042
August	2,988
September	1,054
October	4,310
November	1,844
December	2,986
Total for the year	22,172"

"There are on hand in the Nursery, ready for distribution the following plants and trees:

Avocado Pear	50
Mango	350
Soursop	50
Pomegranate	30
Rose Apple	50
Eucalyptus (assorted varieties)	150
Casauarina Equisetifolia	8,150
Crotons (in variety)	1,000
Cassia (in variety)	200
Calabash Tree	25
Poinciana Regia	400
Thevitia Nerifolia	30
Total	12,240"

"In addition to the above, 10,000 Casauarinas have been sent to the Nuuanu Forest Station for planting, in the forest. Also there are on hand, the following varieties of palms for distribution:

Cocos Plumosa	200
Latania Borbonica	200
Livistonia Rotundifolia	75
Ptychosperma Alexandria	1,350
Oreodoxia Regia	200
Phoenix (in variety)	1,000
Thrinax Argentia	600
Sabal Blackburnianum	200
Areca Alba	230
Areca Rubra	200
Washingtonia Filifera	100
Caryota Urene	100
Seaforthia Elegans	750
Total	5,005"

Prof. Koebele forwarded from Mexico on his recent visit there, the following plants:

Banana plants (10 kinds)	36
Manila Mango	24
Dion-espinosum	5
Macrozamia Mexicanum	2

And the following seeds: Castilioa Elastica (Mexican rubber), Box Elder, Cypress (Mex.), Chamadora Gracilis.

Mr. Haughs reports as follows for Nuuanu forest: "During the year there have been planted 21,832 trees of the following varieties, viz:—Acacia Koa, Grevillea

Robusta, Casauarina Equisetifolia, Casauarina Quadrivalvis, and Syncarpia Laurifolia; there are about sixteen or eighteen thousand trees, mostly of the various kinds of Casauarina, yet on hand for planting." There are six Japs employed under the direction of Mr. G. H. Moore, who commenced work as Forester for that station September 1st.

"At Makiki Forest, one Jap is employed, keeping the trails in repair and looking after mischievous persons, and to prevent damage by fire or otherwise; about six acres of forest have been thinned." Portuguese, who paid from 50 cts. to $1.50 per cord for the wood, standing, did the work of forest thinning. From the six acres, the Government realized $100.50, returning quite a fair rental, besides a good growth of forest trees left standing.

This should demonstrate that waste lands could be made to return a good revenue to the Government if properly planted, especially, when more valuable timber than is in the present forest could be grown. When the Casauarinas, now being planted, are ready for cutting, they should return a much larger revenue, not only being better for fuel, but when of proper size, will be suitable for piles and heavy timbers in wharf and bridge building.

Casauarina and Koa are the principal trees being planted now; they are not only suited to soil and climatic conditions, but produce more valuable timber than the varieties of Eucalyptus heretofore planted.

There has been received from various parts of the world, on orders sent from this office, a variety of economic tree and plant seeds, among which may be mentioned: Hevea Brasiliensis (Para Rubber), Croton Tiglium (Croton Oil Plant), Piper Nigrum (Black Pepper), Garcinia

Mangostana (Mangostene), Sterculia Acuminata (Kola Nut), Erythrina Lithosperma (for coffee shade), Bassia Latifolia, etc. In some cases the vitality of the seed was not sufficient to sprout them, but others are doing well, notably, the Para Rubber. When the various plants are well established they will be distributed where it is most likely they can be successfully grown. Among other desirable trees, the Camphor will be given extensive trial as soon as stock is procured; the tree thrives well on the various islands, and it is hoped it may become of commercial value to the group. Quantities of the plants will be distributed as soon as they are ready, to those who are willing to give them a careful trial.

A quantity of seed of the true Algeroba (Ceratonia Siliqua) has been obtained from Southern California and distributed throughout the islands, and a quantity has been placed in the hands of Mr. Haughs to propagate plants for distribution. It is believed this tree will prove as valuable for the higher elevations as a food producer for animals, as the common Algeroba (Prosopis Dulcis) is for the lower lands.

The present location of the Government Nursery has become so grown up with the specimen trees planted years ago, that there is not room for making experimental plantings. Until a more commodious and a better location is provided, very little can be done except to grow a few seedlings of various trees, etc. for distribution; this work could be better and more economically done with better facilities.

With the present accommodations, the showing of practical results must necessarily be limited to much the same lines as in the past, and if this Department is to

accomplish a tithe of the work that needs to be undertaken, larger and better accommodations will have to be provided. The reservation on the Makiki side of Punchbowl slope offers splendid opportunities for certain lines of work, and when funds are available, there should be a showing made that will be a credit to the Government, and be the central station of a system of experiment stations that should be established on the various islands and at different altitudes. With as wide a range of climatic conditions as are presented on the islands, no one location can be made to give the best result, experimentally. Hence, a well arranged plan for a series of experimental stations should be formulated and put in operation at the earliest date possible. This Department is now frequently called upon for information that cannot be given, except on a basis of positive experimental results, and until such can be done, we are falling short of what we should accomplish.

What the planter needs, is positive information based upon facts, determined by local experiments, and the demand for such facts is increasing; until the work is taken up in a systematic manner by this Bureau, we cannot look for any great advance in diversified agriculture.

Report has been made to this Bureau from some of the coffee districts of Hawaii, of a fungus injuring the crop of berries, causing one side of the cherry to dry and shrivel, arresting development; the beans from such being discolored and worthless. From the best information obtainable, the conclusion was reached that the trouble was caused from local conditions of excessive moisture, and poor drainage, causing a sodden condition of the soil. Samples of infected fruit were sent to Wash-

ington, and in due time a report was received from B. T. Galloway, U. S. Government Pathologist, as follows:

"The fungus is a Fusarium; so far as can be deter-
"mined, it has not been reported as occurring on coffee.
"The spores, or reproductive bodies, of the fungus are
"quite abundant on the surface of the berries, and the
"Mycelium, or vegetative portion penetrates the tissue
"in all directions.

"Similar fungi occur in this country on various plants
"and sometimes occasions considerable injury under cer-
"tain conditions of moisture and heat. We see no reason
"for alarm in this particular case, however, and believe,
"with proper care, the disease may be held in check.
"Doubtless surrounding conditions, such as soil, rainfall,
"etc., have much to do with the prevalence of the dis-
"ease, and probably in localities where the rainfall is not
"so great, the fungus would not occur in sufficient quan-
"tity to be noticed.

"In the matter of preventative measures we can only
"suggest the careful gathering and destroying of as much
"of the diseased material as possible, together with the
"best cultivation, under existing conditions. By keep-
"ing the plant in a good, strong, growing condition much
"can be done towards holding the fungus in check. We
"have had no experience in the use of fungicides on coffee,
"but from the beneficial results in the case of other
"plants, it is possible that good would follow the appli-
"cation of Bordeaux Mixture.

"The first application should be made, if possible, in
"advance of the fungus, and further treatment every ten
"days or two weeks, about as suggested for the grape,

"in Farmer's Bulletin No. 38. Of course in such a case "as this, experiments will have to be made in a limited "way at first and then if the work is found beneficial, it "can be extended."

It is well for the planters to maintain thorough vigilance, in the matter of various pests and diseases; but there should be no occasion for any one to have grave apprehensions of disaster upon the slight provocations that are continually occurring in all lines of agricultural pursuits. What is needed is a careful study of conditions producing the unfavorable as well as the successful results; the unsuccessful experiment will often be the most profitable in teaching how to proceed, if we will only profit by the lesson. All lines of work have their enemies to contend with, and the only safeguard is to be alert, and progressive students of the conditions that have to be met. The coffee grower must not expect immunity from disease and insect pests, but prepare himself with a knowledge of his enemies, and the remedies to apply. I would urge every community engaged in coffee growing, or other lines of agricultural work, to meet together at least once a month for interchange of ideas; there is no line of education that is doing the agricultural class so much good as the Farmer Institutes, Horticultural Societies, Farmer Clubs, and similar organizations.

There is no way in which the average planter can increase his prospects of success so surely as with an honest interchange of ideas with his neighbors; and this can be best brought about by some sort of community gathering, where all can contribute their mite, and at the same time be benefitted four-fold. Such organizations

would very materially increase the value of this Department as a source of information; they would at once become the distributing agency through which all information on matters of general interest could be disseminated, and place the whole community in touch with this Bureau. So much has been accomplished in other countries in this manner, to the great benefit of all connected with the movement, that it is to be hoped something may be done in the same line here, by those interested.

The attention of this Bureau has been called to the desirability of introdcing silk culture into the islands, by Mrs. E. P. Keeney of San Diego, California. It appears to me that all the conditions for carrying on this industry are here, even to a class of people to whom such an industry would contribute profitable employment.

With the idea of encouraging those who take an interest in such matters, I have secured cuttings of the choicest varieties of Mulberries for producing food for the worms and will secure some eggs, which will be placed in the hands of those who understand their care, for propagation as a source of further supply for distribution.

The United States import from the Orient, over $3,000,000 worth of raw silk annually, which passes our doors. With the extremely favorable conditions and a large Oriental population, why should we not contribute to the supply, which is not adequate to the demand and at the same time keep some of the money at home?

This industry would be especially valuable to the young Hawaiians, if they can be once interested in taking

up the work. Instruction could be given through the schools, especially such institutions as the Kamehameha Girls' School.

Instruction and practical training in the work could be given to teachers in our Normal Training School, who could, in turn, take up the work with their pupils, using it not only as a Nature study, but at the same time training the girls in a useful employment.

Respectfully submitted,

BYRON O. CLARK,

Secretary and Commissioner of Agriculture and Forestry.

REPORT OF THE ENTOMOLOGIST

OF THE

HAWAIIAN GOVERNMENT.

HONOLULU, H. I., Dec. 31, 1898.

JAMES A. KING, ESQ.,
Minister of the Interior.

SIR:—I herewith submit to you my report for the year 1898. Having been absent from the islands considerable part of the time, engaged in the collecting and importing of beneficial insects, with which the best and only permanent effective results can be expected, no time has yet been found to ascertain what progress, if any, the recent arrivals have made. Again numerous beneficial insects have been collected in various parts of California, Arizona, Texas, Mexico and Penn. We have imported successfully two species of *Omus*, one *Tetracha*, and several *Cicindela*, of the *Carabidae*, most any species found were taken, yet particularly so with *Calosoma*, the best enemies for cut-worm. *Pterostichus* and *Amara* were well represented. We followed the advice of Dr. Howard and imported such parasites and enemies of the horn-fly as were met with. It also occurred to us that a very simple

and, if successful, practical plan would be, to introduce all such beetles that are known as tumble-bugs, insects that roll up the manure in balls for burial; others that form tunnels of various sizes and lengths, generally direct under the dung and fill the same. Some of these beetles will form burrowings about one inch or more in diameter, and two feet in length, running out from the dung, between six and twelve inches below ground; after filling the same a new tunnel is started in another direction. Often three and four such may be found on one spot and the greater part of the dung buried all within a few hours by a single pair of beetles.

Some of the manure is eaten up by the larvae of those beetles yet a good part of the same always remains buried. These beetles are not only of value in preventing the horn-fly from breeding by removing the manure, they also benefit the soil by loosening and fertilizing the same.

In Mexico, large numbers of a pale colored coleopterous larvae were found in and under old cattle droppings the head with its strong mandibles and first segment dark brown, two small fleshy projections on last segment; it is when full grown about three-fourths of an inch in length; often from fifteen to twenty such larvae could be counted under one dropping, and here busily engaged in devouring the larvae and pupae of flies breeding in manure. The mature insect of this is a flat, shiny black beetle, *Hister*, and is always met with under dung while searching for beetles. Many of these were collected and sent here. We have collected numerous species of hymenopterous parasites, likely to prey upon cut-worms. Also large numbers were bred from such

larvae and sent here in pupa state as well as several valuable species of *Tachina* flies.

Two very important insect pests have made their appearance on the islands during the year, these are the Horn-fly, *Haematobia serreta*, Rob-Desv, and the cabbage butter-fly, *Pieris rapae*, *Schrank*, both coming from the west coast of the U. S. A. The first has undoubtedly been imported with live stock, and the second came here with the quantities of cabbage brought.

Another common cabbage worm, *Plusia brassicae*, has as yet not been observed but may appear at any time. With *Plutella cruciferarum*, *Zell*, a cosmopolitan insect, and of early introduction, we will have the list complete so to speak, and it will become more and more difficult to raise any of the cruciferous garden plants. Not even suspecting the presence of the Pieris butter-fly here, we have sent and brought from the Atlantic coast large numbers of its most effective parasites, namely: *Apanteles congregatus*, and *Migrogaster Glomeratus*, *Copidosoma trunctatellum*, Dalman, of which some 20,000 specimens were liberated, may not live upon the cabbage worm, yet both in Europe and America it has been bred from many hosts, and it may be expected to breed here on the numerous *Plusia* larvae, cut-worms, the Pelua, the various *Pyralid* larvae, where it finds plenty of hosts on the cocoanut trees.

But one species of a Lizard was sent here, this is *Gerrhonotus carrinatus*, living amongst rocks in California. The specimens were sent to Lihue Plantation and may there help in the future to destroy the cane borer.

Repeatedly we have been requested to import insectiverous birds to the islands, such as fly catchers, wrens, the titmouse and others. Whilst the above named species very likely would prove to be chiefly if not entirely insectiferous yet it is a question what good we could accomplish with the same. They would help us rid the cocoanut of some of their *Pyralid* larvae and pick up any other kind of worms coming in their way during day time, as well as flies, etc. I am positive that they equally as well will also destroy the various larvae of lady birds, lace wing flies, and parasites of the injurious larvae, scale insects, and aphids, which they themselves do not eat in sufficient numbers to keep them in check. We have had most remarkable success in overcoming the injurious effects of all the scale insects with predatious and parasitic insects introduced, so much so, that most of the species, formerly covering nearly all the trees and shrubs, are rarely to be seen now. In fact, none of the sixty species or thereabout, known to exist on the islands can now said to be detrimental to plants. We are confident of overcoming most, if not all, the injurious effects of insects upon plant life with the introduction of their natural parasites. And moreover, we also know that these predatious and parasitic insects never will become a source of complaint as we may expect even from the best of birds.

The Japanese beetle (*Adoretus-umbrosus*), has gradually diminished on the Island of Oahu, chiefly owing to the fungoid disease brought amongst them over two years since. During Spring, it appeared also in large numbers on the Islands of Kauai and Hawaii, having now spread over all the islands.

Specimens collected at Lihue, Kauai, during May, and others received from various parties on the same island, have always produced large numbers of *Sarcophaga* flies. Generally it is not admitted that these flies are parasitic, but said, they only deposit their maggots upon death insects. Repeatedly we obtained larvae from Japanese beetles collected the night previous, while feeding upon rose bushes, etc. We obtained maggots of these flies from various *Scarabaeid* beetles in Mexico and have on numerous occasions observed the flies darting at and depositing their larvae upon grasshoppers while on the wing, both in California and New Caledonia, where the flies were bred.

So numerous were those maggots that we have had the greatest difficulty in spreading the fungoid disease amongst the Kauaian material, it required the greatest vigilance and daily destruction of the fly maggots to obtain the required result. The fly is very common on all the islands, and Brother Matthias of Hilo also reported the continuous appearance and destructiveness of the maggots amongst the beetles in boxes where it is not possible for a fly to enter or even drop in its maggots. These dipterous larvae are also subject to the attacks of the fungoid disease. We wish here to express our everlasting gratitude to Brother Matthias of Hilo, who labored so faithfully and gratuitously during the whole season, distributing over two hundred thousand of the infected beetles with two different species of fungoids.

The introduced toads and frogs are still on the increase and their beneficial work is felt everywhere. Several thousand of the same were collected and sent to the various

islands during spring. We know that the California bats are still present, occasionally one is seen, and we have been told of one coming into a room on two occasions during November, and this unfortunately, had been destroyed.

While in the State of Morelos, Mexico, during September the *Lantana* question was looked into somewhat. Naturally, in its native home it may be expected that numerous insects will live upon the same and in consequence the plant is never found to be a pest as it proves in tropical countries where it had been introduced.

The chief reason, no doubt, is the scarcity of seeds the plant is able to produce. Some five white flowering plants found were examined, and upon the whole not more than some six mature seeds were noticed. Large numbers of immature berries were collected and from these various insects were bred. A small *Trypeda* fly, its larvae living within the seeds may be one of the most important. A *Cecidomyid* fly, a *Chalcid* form may likely breed in the seeds. A small *Tineid* was numerous, yet more so a *Pyralid* which hatched out in large numbers.

The larvae of a small blue butter-fly, a *Lycaena*, is feeding upon the young seeds. Besides, we bred a large number of parasites living on the insects above mentioned. The forms of *Lantana* so prevalent here were only seen rarely and as small plants, apparently producing a few good seeds, yet on dissection it will be found that nearly all of these contain small larvae of a dipterous insect eating out the same. In a pill box, some of these seeds were preserved and in due time a small black fly issued from some of them, the most becoming too dry. The insect has been pronounced a species of *Acromyza*.

We are advised by authorities not to attempt the introduction of any of these insects, yet the Cecidomyid and Acromyza flies deserve our attention, whilst the rest of hosts are known to be more or less injurious. By a careful study of the Lantana and its enemies in its native country, we could doubtless find numerous insects detrimental to the same, which could safely be introduced here.

We have made arrangements for seeds to be sent and shall proceed with only the most careful caution.

THE HORN-FLY.

(*Haematobia serrata*, Rob-Desv.)

About the middle of April my attention was called to a troublesome fly upon cattle, and on the 26th of the same month, the first specimens were brought to me by the Government Veterinary Surgeon (Mr. Rowat). On the 30th of the same month, we visited the Kaneohe ranch where the fly had already become very numerous. On May 16th a few flies were already noticed at Lihue, Kauai, and during the summer it spread over all the islands. Much has been published in the various governmental reports in Washington about the habits and life history of the insect, which had been introduced from Europe about 1886, and very likely in the vicinity of Philadelphia. From here the flies spread and during 1891 they were reported from all the Eastern States, Canada to Texas and west to the Mississippi valley.

APPEARANCE OF THE FLY ON OAHU.

Mr. J. P. Mendonca of the Kaneohe ranch noticed the flies first during February, 1898, and we may infer that

at least two to three months should be allowed before they became so numerous as to be noticed. The fly has without doubt come over with cattle from the west coast. Recently on a return trip from Hawaii, some cattle were brought out to the steamer at Kawaihae, where it is required of the animals to swim about half a mile; many of the flies were noticed to arrive with them, although only part of the head is above water during the distance, showing how tenaciously they cling to their prey. As late as 11 p. m. several flies were found around lights in rooms, even then rather active and hard to capture. It has been found in the States, that the eggs are deposited during day time, chiefly between 9 a. m. and 4 p. m., and more particularly during the warmer morning hours. They are laid singly and usually upon their sides upon the surface of wet dung the moment the latter is dropped.

Upon hatching the larvae descend into the dung, and here, in about five to six days become full grown. The maggots have the usual bone color, are about two-fifths of an inch in length. The puparium is formed in the ground beneath the dung. In America the time elapsing from the egg to the adult is from ten to seventeen days, averaging about two weeks, and it is supposed there are seven or eight generations annually. In the perpetual warm climate of the islands we may reasonably expect twenty broods. The characteristic habit of clustering about the base of the horn is developed only when the flies are quite abundant. When they average only a hundred or so comparatively few will be found on the horn. The horns are not the only resting place, a vast number of them cluster also upon the back, between the head and fore shoulders, where they can be reached by neither head nor tail.

REMEDIAL MEASURES.

Everywhere in the States the injury of this pest has abated after the first two or three years in all localities where it had appeared, and we may expect the same conditions here. Around Honolulu at least, the early stages of the fly are now almost entirely destroyed by our small brown ant, with its large headed soldier. We found them in large quantities in every dung hill examined, and not a single fly maggot will escape destruction of these industrial little insects.

It is also claimed that the mynah birds are destroying large numbers of the maggots. For the direct protection of cattle, the remedy most generally adopted, is the daubing of the parts most affected with some sticky, offensive substance to repel the flies. Of these, a mixture of fish oil, or train oil, and tar in equal parts is found one of fish oil, or train oil, and tar in equal parts is found one of the most permanent and effectual. Train oil alone, is used with satisfactory results. Axle grease and tar, in equal parts, is also used with very good results. Spraying with kerosene emulsion, or even pure kerosene, has not proved a success at the Kaneohe ranch where numerous experiments were carried on.

For the destruction of the larvae, lime is spread daily over the dung hills in some parts of the States, and it is claimed with good results. Here on the large ranches such remedy cannot be thought of. Nor would the suggestion to spread out the dropping of manure, by drawing bush across the fields, to rapidly dry the same, be of much value in the extensive field, more or less covered by Lantana and guava bushes. Such remedies

could with advantage be applied in small pastures, and around houses where the daily removal and burial of the manure has been found of great benefit. A machine for catching flies from the backs of cattle, and so affording the animals relief and comfort, has been invented by a farmer in Madison County, Kentucky. The fly-catcher is a kind of covered pen or passage way, through which the animal must walk to secure relief. A few feet from the entrance there is a cupola, or dome, in the roof of the passage way, made of glass and arranged as a fly trap. Beyond this the passage way is in darkness. The animal walks through the machine, and just as it passes the dome and enters the darkened part a set of bushes sweeps off the flies, which naturally rise into the lighted dome, and the steer passes out at the other side free from flies. The flies are retained in the dome trap. The inventor has experimented with his machine, and finds that animals soon learn the value of the machine and know enough to walk through it when the flies begin to bite. The device is said to be patented, but a plan involving the same principles has been in use among farmers for the destruction of horn flies for a year or two past.—(Denver Field and Farm, April 25, 1894.) Such or similar machine, properly constructed, may be of value on some of the larger ranches should the numbers of the fly not soon decrease, yet we are in hopes this will be the case.

THE CABBAGE BUTTERFLY.

(*Pieris Rapae*, Schrank.)

The insect is a native of Europe, and has appeared in North America about 1857. Here it was first noticed

during September, and is now quite common in and around Honolulu, having undoubtedly been brought over on cabbages from California where it appeared some four years since. The yellowish longitudinally ribbed eggs are deposited generally on the under side of the leaves; from this the young larvae hatch in a few days and begin their destructive work upon various Cruziferous plants, particularly the cabbage. It is known in America to feed also upon cauliflower, mustard, turnip, radish, nignonette, sweet alysum, gilly-flower and nasturtium Ordinarily, the larvae requires about two weeks until it becomes fully grown, here the time for its development will be considerable less and as it breeds equally fast all the year round, it soon will spread over all the islands, and some of the native *Cruciferae* will not be exempt from its attacks. The full grown larvae is pale green, finely dotted with black, with a yellowish stripe down the back, and a row of yellow spots along each side, yet none of the yellow markings are distinct. The Chrysalid is variable in color, generally pale green and speckled with fine black spots. It is said in the United States that the Chrysalid during warm weather, in summer, becomes a butterfly usually in about two weeks; we have bred it here in half that time.

NATURAL ENEMIES.

The Chrysalids are destroyed in quantities by the larvae of a minute parasitic fly, belonging to the family of *Chalcidae*, and known as *Pteromalus puparum*. This parasite has been present on the islands for a long time, as we have bred it from the Chrysalid of the native butter-fly, *Pyrameis tamehamea*, and again, has been repeat-

edly sent here from California during the season. Another, and most important parasite is *Apanteles congregatus*, this also was introduced here during the season from the United States, as well as many other species that may prey upon this larvae. As to *Copidosoma truncatellum*, liberated here in such large numbers, it may breed upon the cabbage butterfly larvae, yet more likely upon that of the numerous *Plusia*, which both in Europe and America it seems to prefer. It has been bred from larvae of *Agrotis*, which represent our cutworms; *Hadena*, *Leucania*, *Catocola*, *Eupithecia* and others. With this as other injurious insects, we can not do better than to assist nature in establishing an equilibrium, by introducing the known and unknown parasites praying on this and related larvae.

Respectfully yours,

ALBERT KOEBELE,
Entomologist.

REPORT

OF THE

Board of Fire Commissioners.

HONOLULU, H. I., Dec. 31, 1898.

JAMES A. KING, ESQ.,
Minister of the Interior.

SIR:—I have the honor to transmit herewith the Report of the Chief Engineer of the Honolulu Fire Department for the year ending December 31st, 1898, to which you are respectfully referred for a detailed account of the Department.

I have the honor to be, sir,

Your obedient servant,

ANDREW BROWN,
Chairman Board of Commissioners, Honolulu Fire Dept.

MR. ANDREW BROWN,
Chairman Board of Commissioners, Honolulu Fire Department:

SIR:—I have the honor to present my report as Chief Engineer of the Honolulu Fire Department for the year ending December 31st, 1898.

FIRE ALARMS.

During the year there have been a total of 22 fire alarms caused as follows:

Spontaneous combustion	1
Electric storm	1
Electric wire	1
Defective smokestack	2
Gasoline stove explosion	1
Oil stove explosion	1
Defective furnace	1
Matches	6
Rubbish	2
Lime	1
Candle	1
Kerosene oil lamp	1
Unknown	3

FIRES ACCORDING TO STATIONS.

No. 5	1	No. 35	1
" 9	1	" 42	4
" 12	1	" 45	1
" 14	3	" 47	1
" 23	1	" 48	2
" 25	1	" 53	1
" 27	1	" 59	1
" 31	1	" 73	1

LOSSES AND INSURANCE.

Total loss	$26,279 24
Insurance on property at risk	27,200 00
Losses paid by Insurance Companies	14,766 24
Losses not covered by Insurance	9,413 00

APPROPRIATIONS AND EXPENDITURES.

PAY ROLLS.

Amount appropriated for 2 years to Dec. 31, 1899	$59,040 00
Amount expended, 1 year to Dec. 31, 1898	21,000 00
Balance	$38,040 00

MATERIAL AND SUPPLIES.

Amount appropriated for 2 years to Dec. 31, 1899	$18,550 00
Amount expended, 1 year to Dec. 31, 1898	4,884 75
Balance	$13,665 25

RECAPITULATION OF EXPENDITURES.

Pay Rolls		$21,000 00
Apparatus repairs	$ 788 85	
Harness repairs	101 95	
Horse feed	2,108 18	
Horse shoeing	325 00	
Supplies	724 15	
Telephone service	264 00	
Fuel	38 00	
Drugs and chemicals	76 25	

New apparatus	322 00	
New harness	130 05	
Sundries	521 07	4,884 75
Total		$25,884 75

CONDITION OF APPARATUS AND COMPANIES.

All of the apparatus has been well and sufficiently repaired as occasion required. I would again state that the Amoskeag Engines at Station 2 require new boilers; otherwise the apparatus is in first class order.

I have also to state that the personnel of the Department is excellent.

Respectfully submitted,

J. H. HUNT,
Chief Engineer Honolulu Fire Department.

REPORT

OF THE

COMMISSIONER OF PATENTS.

HONOLULU, H. I., Dec. 31, 1898.

JAMES A. KING, ESQ.,
Minister of the Interior.

SIR:—I have the honor to submit report for the Patent Office Bureau for the year ending this date. The number of Patents issued during the year were fifteen, and, as shown by the following list, they were for Improvements and Devices of varied character:

No. of Patent.	Patentee.	Invention.	Date of Patent.
136	Robert Denneston Hume	Can Making Machinery	March 3rd.
137	Francis May Hamilton, Executrix	Partitions for Cooking Stoves and Ranges	March 17th.
138	John Martin Sass	Improvements in Refrigerating Appliances	March 17th.
139	William Dunn and Alfred Dunn	Method and apparatus for condensing juice	April 12th.
140	James Mallon	Mechanism for Unloading and Feeding sugar cane	April 12th.
141	James W. Paige and Theron S. E. Dixon	Improvements in methods of operating steam and air Turbines	May 11th.
142	Ezra Torrence Gilliland	Manufacture of mouthpiece for Cigarettes	May 11th.
143	Arthur F. Brown and David F. Graham	Improvements in Underfeed stokers	May 11th.
144	Ezra Torrence Gilliland	Improvements in machinery for making cigarettes	June 15th.
145	Robert S. Moore	Improvements in Holding Device or Apparatus for Riveters	July 5th.
146	Joseph F. Kilby and John Taylor	Sugar Crystallizers	July 5th.
147	John Robert Parker	Dredging Apparatus	July 18th.
148	John Charles William Stanley	Improvements in or relating to the treatment of Cotton Seeds	Sept. 20th.
149	Arthur W. Grant	Improvements in Rubber Tired Wheels	Nov. 11th.
150	Arthur W. Grant	Equipping Vehicle Wheels with Rubber Tires	Nov. 11th.

Of the above list, only two applicants were residents of the islands. No appeals from the decision of the Commissioner have been taken up to this date, although it has been found necessary to reject some claims made by different applicants.

I am, sir,

Your obedient servant,

C. B. RIPLEY,
Commissioner of Patents.

REPORT

OF THE

Superintendent of Public Works.

HONOLULU, Dec. 31, 1898.

JAS. A. KING, ESQ.,
Minister of the Interior:

SIR:—The earliest appropriation made by the last legislature for work under this bureau was a special appropriation to repair the damage caused by a storm and floods which occurred on the 26th and 27th of March, 1898, carrying away the bridges at Kahana, Punaluu, Laie Maloo, Laie Wai, in Koolauloa; and at Waimea, Anahulu and Opeula, in Waialua, besides serious damage to the roads in a number of places.

The same storm struck the south side of Kauai, carrying away the new bridges at Lawai and Palikea in Koloa, besides making some bad cuts in the Lawai Hoaea road, also three spans of the Hanapepe bridge and one of the piers of the Waimea bridge. Portions of the Hanapepe bridge were afterwards found on Niihau.

The two bridges washed away from Opeula, lodged

on the reef and were recovered, and re-erected, renewing some portions. The abutments were raised so that the bridges are three feet higher now than before.

The amounts expended from the special appropriations were as follows:

ROADS AND BRIDGES, OAHU.

Kahana, 60-ft. span	$ 1,267 14
Punaluu, 2 60-ft., 1 35-ft. span	1,626 03
Laie Maloo, 60-ft. span	2,155 07
Laiewai, 60-ft. span	460 70
Malaikahana, 30-ft. span	400 21
Kahuku, 20-ft. span	52 90
Waimea, 2 100-ft. spans, steel	3,116 06
Anahulu, 2 75-ft. spans, 1 40-ft. span	5,435 36
Opeula, 2 70-ft. spans	1,884 87
Piikalauae, repairs to abutments	199 00
Road repairs, Koolaupoko	315 40
Road repairs, Waialua	1,386 74
	$18,299 48

Besides the three spans put in at Punaluu, a fill was made 100 feet long and 9 feet deep in the middle. A cut was made by the flood across the Kahana beach which for a time effectually closed the usual road. In a few weeks, however, this was filled in by the surf and the road along Kahana beach is as good as ever.

The bridge washed out at Laiemaloo was only a 35-ft. span but was replaced by a 60-ft. span and besides this a considerable fill was made for the approach. The road was moved a few feet mauka to a point where a

sandstone ledge on the Kahuku side afforded a secure foundation for abutment.

At Laiewai there was very little damage to abutments, the bridge being floated off. Although most of the material was recovered, it was badly rotten and a new span was erected.

The amount expended for Waimea includes:

Purchase of 2 100-ft. steel spans	$2,036 16
Road to bridge, both sides of river....	906 40
Cement for abutment	155 00
Advertising	18 50
	$3,116 06

The bridge is located further up stream which necessitated the construction of road on each side leading up to it. The bridge which was carried out was a trestle bridge and was carried away by an accumulation of trees and rubbish brought down by the freshet. By putting two spans of 100 feet each, ample space will be given for the passage of similar accumulations in the future. The erection of the bridge is nearly accomplished.

The bridges washed away at Anahulu were two foot bridges of 60 feet span each. The highway for teams was through the river, but this flood cut the bed of the stream to such a depth that fording became impracticable and two 75-ft. spans were made across the Kawailoa stream and a 40-ft. span across the outlet from Ukoa fish ponds. A road between the two has also been constructed which is a great improvement on the old road across the sand.

ROADS AND BRIDGES, KAUAI.

The appropriation for Kauai was spent as follows:

Lawai bridge and road	$3,429 02
Palikea bridge	455 22
Hanapepe bridge	2,606 39
Waimea bridge	2,709 37
	$9,200 00

The Lawai bridge was replaced with a longer span and special care was taken in building the abutments, so it is hoped that with the increased opening, a similar freshet would do no damage to the bridge.

The Palikea bridge was also increased in span and better foundations put in for the abutments.

At Hanapepe two spans of 75 feet each were constructed instead of the three spans of 50 feet which were washed away. The center pier is of hard wood piles cased with cement. It was found that the old piles had been eaten nearly off by some animal whose action resembles that of the limnoria, but as the water is fresh it is not likely to be the same.

In repairing Waimea bridge it was thought wise to combine the repairs of flood damage with those that had become necessary by reason of the age of the bridge, and the eight pile piers have been replaced with permanent masonry piers. Excavations were made in the river bed for the foundations to depths varying from 3 to 6 feet. These were filled with concrete to the level of the surface of the water and above this, masonry piers were carried up to support the bridge.

Taking the regular appropriations in the order in which they occur in the bill I will give such items as seem to be worth recording.

INCIDENTALS AND TRAVELLING EXPENSES.

Travelling expenses, Supt. Public Wks.	$293 74
Books and papers	46 75
Telephone	48 00
Stationery	89 41
Postage Stamps	79 00
Implements and office material	271 24
Miscellaneous	28 45
	$856 59

REPAIRS—FURNITURE AND ADDITIONS TO GOVERNMENT BUILDINGS.

Executive Building	$ 1,223 05
Executive Building fence	280 00
Executive Building band stand	316 16
Judiciary Building	1,282 12
Judiciary Building fence	14 70
Kapuaiwa Building	91 65
Government Observatory	2 12
Government Stables	9 39
Storehouse, Miller St.	25 00
Government Dispensary	60
Government Workshop	8 73
Custom House	1,190 70
Pilot's Office	49 11
Honolulu Post Office	4,967 00
Laupahoehoe Post Office	8 00
Police Station	48 20
Oahu Prison	482 50

Central Fire Station	223 28	
Engine House No. 1. ....$ 11 98		
Engine House No. 1, shed 880 14		
———	892 12	
Engine House No. 3.	1 82	
Royal Mausoleum	65 00	
Electric Light Station fence	115 89	
———		$11,297 14

MILITARY.

Bungalow . . . . . .$	1,027 99	
Barracks	164 97	
———		1,192 96

RENTED BUILDINGS.

Honolulu Hale . . . . . .$	136 15	
Market House	1,902 74	
Pacific Mail Warehouse	103 04	
Powder Magazine, Honolulu	4 75	
Powder Magazine, Hilo	35 00	
———		2,181 68

COURT HOUSES AND JAILS.

HAWAII.

Hilo Court House .. ..$	1,886 35	
Hilo Court House flag pole	2 30	
Sheriff's Office, Hilo	2,373 77	
Hilo Jail	4 19	
Laupahoehoe Court House	152 06	
Laupahoehoe Jail	15 00	
Court House, Pohoiki	2 95	
Court House, Kailua	31 00	
———		4,467 62

MAUI AND MOLOKAI.

Wailuku Court House	$ 425 70	
Wailuku Jail	42 91	
Paia Jail	5 90	
Lahaina Court House	20 00	
		494 51

OAHU.

Hauulu Court House	$ 1 00	
Waianae Court House	5 00	
. .		6 00

KAUAI.

Waimea Court House	$ 45 00	
Koloa Court House	56 21	
Koloa Jail	29 14	
Lihue Jail	14 00	
Kapaa Court House	33 25	
Kapaa Jail	23 75	
		201 35

LIGHT HOUSES.

Custom House Light, Honolulu .	$ 3 60	
Keeper's House, Honolulu	35 00	
Keeper's House, Kalaeokalaau . .	79 57	
Makena Light House	37 77	
Laupahoehoe Light House	47 66	
Paukaa Light House	5 00	
		208 60

MISCELLANEOUS.

Moving old buildings .. ..$	17 75	
Carbolineum for sundry use	44 00	
		61 75
Total		$20,111 61

LANDINGS AND BUOYS, HAWAII.

Honuapo Wharf .. ..$	194 75	
Pohoiki Wharf	64 60	
Waiakea Boat Wharf	124 54	
Waiakea Ship Wharf	3 40	
Hilo Wharf	136 72	
Hilo Buoy	114 50	
Laupahoehoe Landing	87 50	
Kailua Wharf	439 26	
		1,165 27

The unusual repairs to Kailua wharf were made necessary by the damage done in landing a ship load of lumber which came to that port direct.

The Hilo buoy was overhauled and repainted in Dec.

LANDINGS AND BUOYS, MAUI.

Lahaina Wharf .. ..$	49 74	
Kahului Harbor	12 00	
		$ 61 74

Although there is no Government wharf at Kahului it became necessary to determine how far the Government would allow private wharves to be built into the harbor of Kahului, and the item is for travelling expenses of Mr. Dodge, who went up to do this work.

EXTENSION KIHEI WHARF.

The wharf at Kihei has been extended a distance of 50 feet, keeping the original width of 30 feet, putting into each side a low section 20 feet long and 6 feet wide to facilitate the handling of light freight from boats.

At the request of the Kihei Plantation a substantial derrick was erected on the wharf for handling machinery. The expense of this derrick was borne by the plantation. The original wharf was built on concrete piles; the extension on wooden piles cased with cement.

The details of expense are as follows:

Labor	$ 518 12	
Lumber	269 93	
Cement	55 00	
Iron Work	55 15	
Tools and Equipment	2 15	
Freight and Travelling Ex.	225 02	
		$ 1,125 37

The whole amount of appropriation was expended but the balance, $74.63, was not paid till after Dec. 31st, so does not appear in the account above.

LANDINGS AND BUOYS, MOLOKAI.

A buoy was placed at the entrance to the Kaunakakai harbor, and the Palaau harbor and channel was marked out by iron pipes driven at intervals along the margin of reef on each side. Soundings were also made and a location was made by the Survey Bureau, which show that although the depth of the channel is from 4 to 7 fathoms, it is so narrow and crooked that it is doubtful

if any considerable use will be made of this harbor at Palaau.

The amounts expended were:

Kaunakakai Buoy .. ..$	5 50	
Location of Palaau Harbor	390 33	
		$ 395 83

LANDINGS AND BUOYS, HONOLULU.

Before the passage of the appropriation bill the repairs to wharves at Honolulu were made from the appropriation for Landings and Buoys General, and in order to show the amount expended on each wharf I will give the detail of the two appropriations together.

Landings and Buoys.	Honolulu.	General.	Total.
Pacific Mail Wharf	$ 5,043 85	$ 253 15	$ 5,297 00
Likelike "	118 13	6 00	124 13
Kinau "	64 95	.....	64 95
Kekuanaoa "	987 23	36 65	1,023 88
I. I. S. N. Co. "	526 47	26 75	553 22
Oceanic "	384 60	25 00	409 60
Brewer's "	614 24	20 50	634 74
Nuuanu Street "	246 55	1 25	247 80
Sorenson's "	7 50	.....	7 50
Market "	59 50	.....	59 50
Cattle "	36 48	.....	36 48
Immigration "	80 00	.....	80 00
Buoys and Moorings.....	1,500 33	23 90	1.524 23
Sweeping Wharves	678 25	97 50	775 75
Store Keeper.....	383 65	51 00	434 65
Pile Driver	326 83	.....	326 83
Tools and Equipment	128 57	.....	128 57
Pilot House	1,518 82	609 15	2,127 97
Miscellaneous.....	292 53	82 15	374 68
	$12,998 48	$1,233 00	$14,231 48

The large amount expended on the Pacific Mail wharf became necessary on account of the settling of the wharf particularly at the Waikiki end. This was a surprise as we had always found hard bottom at no very great depth in driving piles for this wharf. It may be accounted for by the change in the lower strata induced by dredging the material from the front and Waikiki end of the wharf. When the dredging was done a very compact layer of black sand was found at a depth of 24 feet and several feet in thickness. This layer has apparently softened by exposure to the water and perhaps also from the percolation of fresh water through it. Where formerly piles struck hard bottom at a depth of from 12 to 18 feet now they are easily driven to a much greater depth. For a length of 100 feet it was necessary to replace nearly all of the piles in the wharf with longer ones.

The economy of the block and asphaltum pavement adopted for Sorenson's wharf is shown by the small amount expended in repairs, as compared with other wharves.

LANDINGS AND BUOYS, KAUAI.

The only expenditure from this appropriation was for Waimea wharf, $312.80.

This was chiefly for renewing the floor of the oldest portion of wharf which was originally of 1½ lumber and had become worn out.

LIGHT HOUSE SUPPLIES.

Fifteen lights have been maintained during the year.

Nawiliwili	$ 51 90	
Barber's Point	31 08	
Honolulu Harbor	240 23	
Honolulu Inner Light	7 00	
Kalaeokalaau	42 15	
Kaunakakai	37 88	
Lahaina	23 25	
Maalea	33 00	
Makena	38 62	
Kawaihae	33 00	
Mahukona	52 50	
Kohala Point	11 50	
Laupahoehoe	33 00	
Makahanaloa	7 50	
Paukaa	29 00	
		$ 671 61

STEAM TUG.

The tug boat Eleu has been severely taxed to get through with the work required of her. This shows in the large bills for coal and repairs, and the long hours and continuous work have made it difficult at times to get men, particularly for the fire room. The price of coal has also been higher than last period, and although the appropriation was considerably larger than for the last period, it will not be sufficient to last through the period.

The items are as follows:

Coal, 271¾ tons	$ 2,254 51	
Repairs	2,118 28	
Hawsers	651 28	
Expense	976 00	
Tools and Equipment	288 00	
Extra Labor	489 60	
		$ 6,777 67

DREDGING HONOLULU HARBOR.

A sand spit on Ewa side of channel just outside of the light house was taken off in February. The slip between Sorenson's wharf and the new Lime Kiln Point or Emmes wharf was dredged out in April and the first part of May. In August the knuckle on the Waikiki side of channel opposite the makai end of the bar dumping ground, was taken off, and in October and November the edge of the channel at the same place was still further straightened and the area dredged in February deepened to 28 and 30 feet. Also it was found that the old Fish Market slip dredged in April had filled in to such an extent that vessels drawing over 18 feet were bedded in the mud, and this was dredged out again in December; this time to a depth of 28 feet. The former dredging had left a bank of mud under the new wharf and this slid into the slip. The number of days the dredger was in actual operation at all of this work was as follows:

Light House Point	17	days.
Channel	54	"
Old Fish Market slip	34	"
Total	105	"

The items of expense are as follows:

Coal	$ 4,460 56	
Labor	7,959 25	
Dredger Repairs	1,031 38	
Pontoon Line	1,330 59	
Dredger Expense	284 47	
Tools and Equipment	88 30	
Retaining walls for material pumped	135 23	
Miscellaneous	112 10	
		$15,401 88

REMOVING POWDER MAGAZINE.

The site selected for the new location of the powder storage magazine is on the reef makai of Kakaako, 600 feet from the shore. A space 74x100 has been enclosed by coral walls and filled to a height of 4 feet above low tide. This is connected with the shore by a roadway 14 feet wide made by building a coral wall on each side and filling in between to the same height. Most of the filling was brought from the bar dumping ground by means of a temporary track.

The total amount expended up to December 31st, is $2,949.04.

The magazine will be a brick structure 20x40 which is considerably larger than the present storage magazine.

CURBING AND PAVING GOVERNMENT SIDEWALKS, HILO.

The work of curbing the sidewalk around the Court House lot in Hilo was begun before the end of the year; the amount expended being $224.85.

ROADS AND BRIDGES, NORTH HILO.

The prison gang has been kept at work during the year on the new road north of Honohina. Before the new appropriations became available the expense of this work was taken for a time from the appropriation for Roads and Bridges, North Hilo, the items of expense being as follows:

Prison lunas and paid labor	$ 347 00	
Teams	429 50	
Blacksmithing	92 60	
Material, Brick, etc.	115 00	
Powder and Fuse	69 90	
Tools and equipment	112 51	
Freight	43 13	
Miscellaneous	40 00	
		$ 1,249 64

ROAD FROM LAUPAHOEHOE TO KIILAU.

A survey for this road was made which went through valuable cane land and the owners of the cane were not willing to give the right of way except in exchange for three rights of way reserved by the Government and it was decided to see if a satisfactory line could be located through the Waipunalei homesteads and across the Laupahoehoe gulch to Kiilau. This experimental line will soon be run.

The amount expended is $254.25.

ROADS AND BRIDGES, HILO.

The amounts expended for this appropriation are:

Repairs to Kaumana road	$ 2,538 78	
Rock crusher for Honolulu to replace Champion crusher, sent to Hilo	860 70	
		$ 3,399 48

PURCHASE OF ROAD ROLLER, HILO.

Bids have been asked for a road roller and a contract made with Henshaw, Bulkley & Co. of San Francisco to deliver a 10-ton Russell Steam Road Roller; amount expended (advertising), $2.00.

ROADS AND BRIDGES, SOUTH KONA.

Of this only $80.50 has been spent. $75.00 on the Napoopoo road and $5.50 freight on coin sent to contractors.

ROADS AND BRIDGES, NORTH KONA.

Of this also only a small amount has been spent, $288.15, chiefly for completion of a contract made last period and some extra work in connection therewith.

MAUI.

ROADS, HANA DISTRICT.

An old bridge at Ohea, near Kipahulu, has been replaced with a 70-ft. span, the abutments being rebuilt and raised. Cost, $908.18.

ROAD, HONOLUA TO KAHAKULOA.

A survey was made for this work, which was not satisfactory, as 12% grades were staked out, and on an examination of the locality I found there was no serious difficulty in the way of making much easier grades, and a new survey will be made.

OAHU.

NUUANU ROAD TO PALI.

A road has been laid out which departs from the present road two-thirds of the way. The steep grades are eliminated without adding materially to the length of road. A contract to construct the road has been let to Chas. B. Dwight for the sum of $29,500. The amounts expended before the close of the year are:

Survey	$ 198 45	
Advertisement	12 00	
On account of contract	1,500 00	
		$ 1,710 45

ROADS AND BRIDGES, EWA AND WAIANAE.

A small amount was expended under this Bureau in the completion of a bridge at Halawa—$384.30.

PURCHASE OF ROCK CRUSHER FOR EWA AND WAIANAE.

A contract has been made with Robt. Catton to deliver a No. 3 Austin Crusher with boiler and engine complete all mounted so as to be conveniently portable. It is a duplicate of an outfit purchased for Honolulu which does very satisfactory work. The amount expended so far was for advertisement, $4.00

ROADS AND BRIDGES, WAIALUA.

The amounts expended have been:

Repairs to Kaupo bridge .. ..$	187 25	
Repairs to road between Waialua and Waimea	411 00	
		$ 598 25

ROADS AND BRIDGES, KOOLAUPOKO.

An appropriation was made for a new road to be constructed from the pali road towards Waimanalo. A road has been staked out on good grades to the ridge just beyond Maunawili and the contract for the portion as far as Maunawili let to Carl Jensen for the sum of $6,550.00 The amounts expended before the close of the year were:

Survey . .. .$	154 59	
Advertisement	4 00	
		$ 158 59

KAUAI.

ROADS AND BRIDGES, WAIMEA.

This appropriation was used in connection with the special appropriation for Kauai, to put masonry piers under the Waimea bridge. The items of expenditure are:

Labor . . . .$	1,210 99	
Cement	503 00	
Lumber	98 21	
Freight and Cartage	83 65	
Tools and Equipment	8 90	
		$ 1,904 75

ROADS AND BRIDGES, GENERAL.

This appropriation was drawn upon early in the year before the special appropriations were available, in order to continue work on the Lawai Hoaea road on Kauai and in North Hilo. The amounts expended were:

Lawai Hoaea Road .. ..$	765 60	
North Hilo	719 25	
Moving Tool Shed	7 50	
		$ 1,492 35

ROAD DAMAGES, ALL ISLANDS.

This has been used to settle rights of way for new roads as follows:

HAWAII.

North Hilo . . ..$	150 00	
Hamakua Kalopa	7 00	
N. Kona	526 00	
S. Kona	402 00	
Kau Ninole	74 57	
		$ 1,159 57

MAUI.

Makawao		380 00

OAHU.

Pali Road . . . .$	1,504 35	
Honolulu	1,438 45	
		2,942 80

KAUAI.

Lawai		165 00
		$ 4,647 37

ELECTRIC LIGHT, HONOLULU.

Early in the year Mr. John Cassidy, who had been in charge of the Government Electric Light Works for about seven years, resigned; his resignation taking effect February 9th. His place was filled by the appointment of Mr. Stearns Buck, a man of considerable experience in electrical work in the East.

The amount expended from the appropriation is $7,247.12, the detail of which is given in the report of Mr. Buck which follows.

The total number of incandescent lights furnished by the Government is approximately 1150; arc lights, 107. If the total amount expended including all line reconstruction is charged up to cost of lights, the average cost of lights will be as follows for the year:

107 Arc Lights, $7,584.21—average $70.88
1150 Incandescent Lights, $5,962.91—average 5.19

I would urge the importance of continuing the work of repairing and reconstructing the lines if there is any way in which the amount estimated by Mr. Buck can be made available. The balance of the appropriation will be hardly more than sufficient to meet the ordinary running expenses till the end of the period.

REPORT OF MR. BUCK.

MR. W. E. ROWELL,
Superintendent of Public Works.

DEAR SIR:—I respectfully submit the following report on the Government Lighting System for the year 1898.

The estimated cost of running street lights must necessarily be more or less inaccurate for two reasons; first, the item for repairs has been much in excess of what it will be in the future; there is more or less uncertainty as to the proportion of the running expense that should be charged to street lighting and the proportion that should be charged to incandescent lighting.

The total expense is as follows:

Salaries and extra labor	$ 7,792 60	
Tools and equipment	1,908 69	
Line material	908 48	
Cloth and waste	55 72	
Carbons	301 30	
Stationery and typewriting	12 20	
Telephone	123 00	
Teaming and stable expense	867 86	
Repair material	1,157 50	
Hardware and paint	94 58	
Damages and expert testimony	225 00	
Oil	100 19	
		$13,547 12

We will deduct from the total the item of carbons and the salaries of two trimmers ($1,320.) and we have remaining $11,925.82 to divide between the arc lights and the incandescent lights, which, with the additional expense of carbons and trimmers' salaries to be charged to the arc lights, gives us an expense of $7,584.21 for arc lighting, and $5,962.91 for incandescent lighting. As we are running 107 arc lights this means an approximate annual cost of $70.88 per lamp.

In regard to the condition of the system, I would say

that the greater part of it is now in good order, but there is still standing some of the old construction work, which should be replaced as it is a menace to life and property.

I have had to discontinue the work of rebuilding the system for lack of money, as there was no appropriation made for this purpose.

I would, however, call your attention to the importance of continuing to replace the old work, and estimate that it would cost about $3,500 to carry on the work to the end of the biennial period.

Respectfully,

STEARNS BUCK,
Superintendent.

Honolulu, Dec. 31, 1898.

REPORT OF COLLECTOR.

W. E. ROWELL, ESQ.,
Superintendent Public Works.

SIR:—I have the honor to submit herewith my report as Collector of Rates for the Government Electric Lights, for the twelve (12) months ending Dec. 31, 1898.

The Amount Collected During 1898 was $958 20
The Amount Outstanding December 31st, 1898 .. 201 00

There are five (5) paying rates using two hundred and thirty-three (233) lights, the receipts from which should be $73.10 per month.

Respectfully submitted,

A. BROWN,
Collector of Rates, Government Electric Lights.

ELECTRIC LIGHTING, HILO STREETS.

The number of lights maintained in Hilo is:

Arc lights	14
Incandescent	25

The total amount expended during the year is $1,442.45.

A few additional lights will be put in as soon as the Electric Co. of Hilo complete the additions to their plant.

RUNNING EXPENSES, LAUNDRIES.

The price of coal has been high and the expenditure rather more than was anticipated.

The items are:

Engineer and Collector	$1,320 00	
Fuel	3,292 95	
Repairs	50 85	
Expense	49 78	
Tools and Equipment	13 10	
		$4,726 68

CURBING AND PAVING GOVERNMENT SIDEWALKS.

Reform School lot	$ 304 48	
Government Nursery lot	181 50	
Judiciary Building, King St.	165 90	
Judiciary Building, Queen St.	202 40	
Haleakala Lot, Beretania St.	43 17	
Government Lot, Union St.	4 40	
		$ 901 85

COURT HOUSE AND JAIL, KIPAHULU.

Specifications for this building were prepared and bids advertised for, but the lowest was above the appropriation, and no contract was made.

Expenditure for advertising, $4.00.

REPAIRS, LAHAINA COURT HOUSE.

This old building required a thorough overhauling and will be put in good shape. The items of expenditure up to Dec. 31, are:

Labor	$ 753 50	
Lumber	135 70	
Cement	66 00	
Freight	24 78	
		$ 979 98

PUBLIC GROUNDS.

The expenditure from this appropriation under this bureau have been:

Emma Square	$ 3 25	
Thomas Square	4 83	
Judiciary Building Fence	312 44	
Executive Building Storehouse	3 76	
		$ 324 28

FORESTS AND NURSERIES.

A drain was put in to carry off the water which after a storm would stand for days on the lower ground in the Government Nursery on King St. Cost, $209.00.

LOAN APPROPRIATIONS.

HARBOR IMPROVEMENTS, HONOLULU.

The work of the dredger was continued after the close of the previous period under the provision in the appropriation bill that expenditures were allowed up to March 31st. To cover this work the Legislature made a special appropriation called "Harbor Improvement Unpaid Bills" while the regular appropriation covers all expenditures after March 31st. In order to see what has been spent it will be convenient to consider the appropriations together.

Light House Channel.

	Unpaid Bills.	Regular.	Total.
Dredger Coal	$ 1,074 82	$	$ .....
Dredger Labor	1,122 85	.....	.....
Dredger Repairs	540 85	.....	.....
Dredger Expense	187 40	.....	.....
Pontoon Line	146 72	.....	.....
	$ 3,072 64		

Richards St. Slip.

Dredger Coal	$ 2,124 35	$ 3,342 31	$ 5,476 66
Dredger Labor	3,869 50	2,877 15	6,746 65
Dredger Repairs	1,622 58	306 44	1,929 02
Dredger Expense	562 23	380 31	942 54
Pontoon Line	440 19	2,235 41	2,675 60
Drill Scow Expense	1,489 65	1,941 23	3,430 88
Drill Scow Labor	1,196 80	2,274 55	3,471 35
Drill Scow Constr't'n	.....	4,346 58	4,346 58

Clam Shell	412 39	340 62	753 01
Tools and Equipment	112 13	55 00	167 13
Total Rich's St. Slip.	$11,839 82	$18,099 60	$29,939 42
Light House Channel	3,072 64	.....	3,072 64
Emmes' Wharf	4,598 61	.....	4,598 61
Richards St. Wharf .	565 21	5,447 76	6,012 97
Purchase Youman's Property	.....	20,053 00	20,053 00
	$20,076 28	$43,600 36	$63,676 64

Dredging in Richards Street Slip was suspended after March 31st, until September, when it was decided to continue the work and to put the drilling apparatus into efficient shape. Two new scows were constructed, a 12-horse power boiler put on one and a 15-horse power on the other. Each scow was equipped with 3 drills and all the necessary tackle. Meanwhile dredging was continued on the Waikiki side of slip where no work had been done. The amount excavated during the month of September was 2,850 cubic yards.

Systematic drilling was also continued over the area previously dredged, beginning with the completion of the first drill scow in October. Up to Dec. 31st, the number of holes drilled was 1,059. Average depth, 8.75 feet.

Cost of drilling and blasting:

	Total.	Average per Hole.
Powder and Caps	$3,042 75	$2.873
Labor	2,181 30	2.060
Coal and Expense	543 40	.513
2% per Month on Cost of Apparatus	218 50	.206
Total	$5,985 95	$5.652

The powder used was chiefly No. 1 Hercules; an average of 11 pounds being used in each hole. The holes were drilled 5 feet apart each way. The area thus prepared for the dredger is over 26,000 square feet and the cubic yards of material loosened not less than 6,000.

As none of this has been removed it is fair in estimating cost of material excavated, to exclude the cost of this blasting as well as that of the apparatus.

Total amount spent in Slip	$29,939 42
Deduct expense of blasting and apparatus	8,562 36
Chargeable to excavation	$21,377 06
Spent previously	48,479 87
	$69,856 93

Total amount excavated, 38,208 cubic yards.
Average cost per yard, $1.83.
The quantity yet remaining to be excavated is about 30,500 cubic yards.

170 feet in length of the new Richards Street Wharf has been completed and 100 feet more partially constructed. The constant use of this wharf and slip by large vessels has prevented further dredging and completion of another section of wharf. The completion of both will be carried out by the Navy Department of the U. S. Government.

BREAKWATER AND WHARF, HILO BAY, UNPAID BILLS.

From this appropriation there has been spent:

Ship Wharf	$6,711 88
Boat "	1,576 64
	$8,288 52

BREAKWATER AND WHARF, HILO BAY.

Also from this appropriation amounts have been spent since March 31:

Ship Wharf	$ 4,046 68
Boat "	1,036 88
	$ 5,083 56

Making total amount on each

Ship Wharf	$10,758 56
Boat "	2,613 52
	$13,372 08

Of this amount $3,759.75 has been on the approaches. The ground was low and much filling was necessary.

NEW WHARF, PAPIHA NAHIKU.

Papiha is a rock ledge projecting from the foot of the bluff at Nahiku. Around the edge of this ledge the water is three and four fathoms deep; consequently the surf does not break even when the swells are running high, and a boat can lie safely within a few feet of the rock at all times with perhaps rare exceptions. To reach this ledge it is necessary to cut a grade 1,225 feet in length

along the face of the cliff. A contract to do this work has been let to Wilson and Whitehouse for the sum of $2,618. A tramway will be laid upon this grade to bring freight from the landing to the terminus of the road to the homesteads.

It was necessary to keep the tramway about 40 feet above sea level at the landing which will make the handling of freight from boats very slow until the business will warrant putting in a steam hoist. A crane will be erected upon the ledge sufficiently high to deliver freight to cars upon the tramway.

The amount expended is—survey and plans—$162.00.

NEW ROAD, KAHUKU TO PAPALOA.

This appropriation was intended to complete the connection between Hamakua and Hilo. The prison gang with camp at Nanue has been kept at work continuously on this line, and preparations were made before the end of the year to let a considerable portion of the road to be done by contract.

Since the prisoners moved to their present camp at Nanue, they have built about three miles of road. The items expended from this appropriation are:

Prison Lunas and Paid Labor	$2,759 65	
Teams	673 17	
Blacksmith Work	110 67	
Bridge Material	892 50	
Freight	239 78	
Expense and Tools and Equipment .	156 85	
Survey	18 00	
		$4,850 62

Surveys have been made for a number of new roads which will be contracted soon after the close of the year.

HOMESTEAD ROADS.

Kaiwiki, Kaumana and Ponahawai—

Survey . . . . . $ 16 00

Waiohinu to S. Kona—

Advertisement . . . . . $ 5 00

South Kona Extension to Kau—

Survey $131 50

Honaunau Upper Road to Road to Napoopoo Landing at Keei—

Survey $117 00

N. Kona Huehue to S. Kohala—

Survey $452 00

NEW ROADS—MAUI.

Nahiku Landing to Homesteads—

Survey $124 50

Hana to Hanawi—

Survey $100 00

ROADS AND BRIDGES—KAUAI.

Moloaa Grade and Bridge—

Survey . . . . . $ 30 00

OAHU.

Bridge at Lauhulu, Waialua—

Labor on Approach .....$ 58 00

Surveys are being pushed ahead and it is expected that nearly all the new roads provided for in the appropriation bill, will be completed by the close of the year.

LIGHT HOUSE AND LIGHT, DIAMOND HEAD (UNPAID BILLS).

This was to cover the expenditures previous to March 31st, which were:

Apparatus	$2,057 25	
Tower	1,372 57	
Foundations	199 53	
Cartage	69 50	
Tools and Equipment	31 34	
		$3,730 19

COMPLETION DIAMOND HEAD LIGHT.

As the Legislature provided that before the completion of the light a stone tower must be erected in addition to the iron tower already constructed, plans have been made and a tower of rubble masonry will be built occupying the same place as the iron tower.

The amount expended from this appropriation is $114.56.

ADDITION TO WATER WORKS, HILO (UNPAID BILLS).

Before the 31st of March there were expended the following amounts:

Pipe	$ 60 32	
Material	6 56	
Labor	107 00	
		$ 173 88

ADDITION TO WATER WORKS, HILO.

Since the 31st of March there has been expended:

Cartage	$ 5 25	
Material	33 77	
Labor	25 25	
		$ 64 27

NEW SCHOOL HOUSES AND TEACHERS' COTTAGES (UNPAID BILLS).

Before the 31st of March the amounts spent on new school houses under this Bureau were:

Pahoa	$ 914 34	
Honokaa	89 25	
Pukoo	7 50	
Honaunau W. C.	109 10	
		$1,120 19

NEW COURT HOUSE AND SITE, KOLOA (UNPAID BILLS).

The Court House was practically complete before the 1st of January, but the few items spent before March 31st, were:

Inspection	$ 3 00	
Moving Jail	30 00	
Fence	29 56	
		$ 62 56

ADDITION TO WATER WORKS, KALAUPAPA.

The contract for supplying the pipe was left to the Martin Pipe and Foundry Co., of San Francisco, at $29.30 per ton of pipe; 2¾c. per lb. of special castings; and 3¼c. per lb. for lead.

The length of pipe purchased is as follows:

8 in. pipe	8,520 ft.
6 in. pipe	13,080 "
Total	21,600 "

The 8-inch pipe will be laid from Waikolu to Kalaauao, the 6-inch pipe from Kalawao to the upper part of Kalaupapa and the present 4-inch pipe will be used for branches.

The office work in this Bureau has been considerably increased by the requirements of the new Audit Act, but it has not been necessary to increase the number of assistants on that account.

I must acknowledge the willing co-operation of the Road Boards in the various Districts in carrying forward the road work planned under this Bureau.

GOVERNMENT REALIZATIONS.

The amounts received and paid into the Treasury through this Bureau are as follows:

269 Building Permits	$1,234 50	
Filling Kapahoanui Lot	52 50	
Rebate on Carbons	12 00	
From Illumination Committee . . .	50 00	
Use of Tools and Clam Shell	1,365 40	
Sale of Old Material	720 96	
Pound Fees Returned	3 00	
Error in Pay Rolls	80	
Wages not Called For	3 00	
		$3,442 16

In cases where application has been made for a number of buildings all alike in construction, the fee for building permit has been reduced below $5.00 which is the fee charged for single buildings.

Respectfully submitted,

W. E. Rowell,
Supt. Public Works.

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BIENNIAL REPORT

OF THE

MINISTER OF THE INTERIOR

TO THE

PRESIDENT AND MEMBERS

OF

THE EXECUTIVE AND ADVISORY COUNCILS

OF

THE PROVISIONAL GOVERNMENT

OF THE HAWAIIAN ISLANDS.

1894.

—o—

HONOLULU:
ROBERT GRIEVE, STEAM BOOK AND JOB PRINTER.
209 Merchant Street, (up stairs.)
1894.

Exch.
N.Y. Pub. Library.
8-20-28.

REPORT

OF

THE SURVEYOR GENERAL.

SURVEY OFFICE, March 31st, 1894.

HIS EX. J. A. KING,

Minister of the Interior:

SIR:—I have the honor to submit the following report of the Bureau of Government Surveying, for the biennial period ending March 31st, 1894.

GENERAL STATEMENT.

The work of the Government Survey during the past two years has been very much hindered by various causes.

The appropriation bill for the biennial period did not pass until January 3d, 1893, nine months after the commencement of the said period. During this long interval the expenses of this Bureau had to be cut down to the lowest possible point, and the services of two of the most efficient members of the staff had to be dispensed with from and after August 31, 1892.

In view of the impending financial distress, and of the falling off in the receipts of the Government, the total appropriation for this Bureau was reduced over 30 per cent., and that for field expenses, including surveys of homesteads, to about one half the sum asked for. Thus this Bureau was crippled both in men and money at the beginning of last year.

In addition to this, the political agitation and uncertainty during the past year, the necessity for strict economy, and the absence of the Surveyor-General on business connected with the Foreign Office for seven months, all conbined to restrict the operations of the survey within narrow limits.

ASTRONOMICAL AND MAGNETIC WORK.

In my last biennial report, I mentioned the double series of latitude observations carried on from June 6th, 1891, until June 25th, 1892, by Dr. A. Marcuse of the Berlin Observatory, and Mr. E. D. Preston of the U. S. Coast and Geodetic Survey, at Waikiki. This work was a complete success, and in connection with simultaneous observations in America and Europe, it has demonstrated the fact that the poles of the earth are affected by a minute periodical rotation. It had also been arranged that this Bureau should assist Mr. Preston in carrying out three series of pendulum and latitude observations at Kawaihae, Kalaieha and on the summit of Mauna Kea, as well as in making a magnetic survey of the group.

To carry out the former plan, a party left for Hawaii on June 28th, 1892, consisting of Messrs. E. D. Preston, W. E. Wall, who assisted him as recorder, W. E. Chamberlain, and the Surveyor-General. The principal objects of this trip were to determine the force of gravity and the deflection of the plumb line at the base and summit of Mauna Kea, and the comparative density of the mountain, as well as the declination, dip and intensity of the magnetic needle.

A station was occupied for a week near the beach at Kawaihae, which was connected by survey with the primary triangulation of the island. At Waimea magnetic observations were made, while preparations were making for the ascent of Mauna Kea. The party then moved to Kalaieha,

south of the summit, at an elevation of 6,700 feet above sea level, where it was joined by Mr. E. D. Baldwin and Mr. J. M. Muir, a volunteer observer, who rendered important service. At this point both latitude and pendulum observations were made, and the station was connected by triangulation to the main framework of the Government Survey. The difficult ascent of the mountain with instruments and tents was made July 20th, and a station occupied for six days on the shore of lake Waiau, at an elevation of over 13,000 feet. The range of temperature was from 13° Fahr. at night to 108° at noon. In connection with the latitude, pendulum and magnetic observations, a topographical survey was made of the peaks and craters of the summit plateau.

The instruments, tents, &c., were safely brought down from the mountain to Kalaieha, July 26th, to be carried from thence 47 miles to Kawaihae, where they were shipped to Honolulu.

Mr. Preston continued the magnetic survey, making sets of observations at Hilo, at Captain Cook's station in Kealakekua, at Freycinet's station at Lahaina, at the Transit of Venus station in Waimea, Kauai, and on the island of Niihau.

Magnetic observations had been previously made at Waikiki, at Honolulu, and at Kahuku, Oahu, making in all 12 magnetic stations.

METEOROLOGY AND TIDES.

A special report will be made on these subjects by Mr. C. J. Lyons. Dr. Mendenhall, the superintendent of the U. S. Coast and Geodetic Survey, has ordered his staff of trained experts to analyze the tides of Honolulu, and expects to be able to publish predictions of them for the year 1895.

In regard to Meteorology, the usual observations have been kept up, and monthly reports published for the benefit

of the public. Exchanges have been kept up with a large number of foreign weather bureaus. From the geographical position of these islands their meteorology is of more than ordinary interest to science.

The clerical and mechanical part of this work is becoming considerable.

SURVEYS OF HOMESTEADS AND GRANTS, &C.

For the reasons given above, the general trigonometrical survey of the country had to be discontinued. The surveys of homesteads and government land sales have been hampered by the same causes. The plan of throwing the expense of such surveys upon the applicant or purchaser has never worked well in practice.

On Kauai a survey of the Government remnants in Waioli was made in April and May, 1893, and the division of the land of Olohena was surveyed the following July by Mr. W. A. Wall.

A tract in the Crown land of Puukapu, Waimea, was laid out by Mr. Loebenstein into homestead lots, which since then have been taken up. Another tract in the Government land of Pauahi in the same district, was laid out in the same way, but has not found a similar demand.

In Maulua-iki and in Kuaia, Hilo, a number of lots were also laid out by him for the purchasers, A forest tract in Kiilau, North Hilo, was surveyed for lease in August, 1893, and the Government land of Kaumana in South Hilo, has recently been surveyed for intending purchasers.

The general survey of Puna commenced in the last period, was continued into September, 1892, through Koae and other lands, by Mr. Loebenstein. Surveys and maps of Kaimu and adjoining lands, of the Olaa lots and of the Volcano road have been furnished to the Government by Mr. E. D. Baldwin.

In June, 1892, a survey of the district around Kailua, Hawaii, was made by Mr. S. M. Kanakanui, a member of this Bureau. He also surveyed a tract of Government land in Makaiwa, Koolau, Maui, last December.

The large-scale section maps of Molokai are nearly finished, but a portion of the northern coast of that island needs to be surveyed in order to complete the work.

The usual amount of city surveying has been carried on by Mr. Dodge, assisted by Mr. Wall. A large number of lots have been disposed of, chiefly on the slopes of Punch-bowl Hill, in Makiki and Nuuanu, and in Kalihi. Under the operation of the "Highways Act," passed October 15th, 1892, a marked improvement has taken place in the streets, and especially in the sidewalks of this city, the credit of which is largely due to Mr. Dodge.

In general, there have been 43 sales and 40 leases of Government land, the surveys and maps of which have had to pass through this Bureau. A full report in detail on the Government lands is being prepared by Mr. J. F. Brown.

OFFICE WORK.

As stated in a former report, every piece of land sold or leased by the Government involves the furnishing by this Bureau of a map and a detailed description by metes and bounds of the land disposed of. All applications for the lease or sale of Government land are referred to this Bureau for reports upon location, area, value, and recommendation to the Minister of the Interior. A copy of each report is retained in this office, and another copy sent to the Minister of the Interior. An important part of the office work is the furnishing of information to private persons on a great variety of subjects relating to land. As often stated before, the task of arranging, indexing and keeping in order the mass of materials

rapidly accumulating in the office, so that any paper or map may be readily found when wanted, requires constant labor and care.

PARTIAL DETAILS OF OFFICE WORK DURING THE BIENNIAL PERIOD, 1892-94.

Reports on applications for lease or sale of Government lands, 212.

There have been registered and put on file in the office 100 maps, making a total of 1685.

Of miscellaneous documents bearing on the survey, there have been registered and filed in this Bureau, 60.

New surveys furnished mostly to the Interior Department, 150.

Business letters by the assistant in charge of office, 301.

Of tracings, there have been 174; of these:

For auction sales	64
To accompany surveys of wants	37
For road purposes	12
Reports of the Minister of the Interior	19
Miscellaneous	42

PROPOSALS FOR FUTURE WORK.

The demands made upon the survey during the next biennial period will probably be great, and constantly increasing.

The work to be done will depend largely upon the future land policy of the Government, and other conditions. There will, no doubt, be a pressing demand for information in regard to available land, especially under the provisions of the Homestead Law. A number of Crown Lands will need to be surveyed, which should be done in conjunction with this Bureau, or under its supervision. The completion of the sur-

vey of the District of Puna is urgently called for. The opening up of much needed roads in various districts, especially in Puna and Kona, Hawaii, will require preliminary surveys. A small outlay will complete the survey of the Island of Molokai.

Accordingly I have asked for the sum of $15,000 for expenses of field parties.

I have the honor to be
Very respectfully,
Your obedient servant,

W. D. ALEXANDER,
Surveyor-General.

REPORT

OF

ASSISTANT IN CHARGE OF METEOROLOGY.

SIR:—I beg to submit the following report of Meteorological work performed during the past two years.

Reports of rainfall have been received from voluntary observers as follows:

On the Island of		Hawaii	30 stations.
"	"	Maui	7 "
"	"	Molokai	1 "
"	"	Lanai	1 "
"	"	Oahu	18 "
"	"	Kauai	6 "
		Total	63

These reports are made upon blanks furnished, and are in detail, giving with a very few exceptions the rainfall at the several stations for each day in the year. Being carefully filed for future reference, they will form valuable material for study. The monthly totals for each station have been published in the *Daily Advertiser* and *Semi-weekly Gazette* about the 15th of each succeeding month. They are now furnished also to the *Star*. About one-half of the rain-gauges in use were furnished by the Bureau, the other half being private property. Envelopes (printed) and postage have been furnished to the observers, and I would suggest that by some

arrangement, as in other countries, weather reports when in due form and in printed envelopes may be forwarded free of charge.

Reports of temperature observations are received monthly as follows:

From W. H. Rogers at Pepeekeo, Hilo;
Dr. Bond, Kohala;
C. D. Miller, Laaloa, Kona;
Rev. S. H. Davis, Kealakekua.

The series from the Volcano House has not been continued.

Barometer reports are received of tri-daily observations at Pepeekeo, Hilo, by W. H. Rogers, who has been provided with a good mercurial instrument. Also once a day readings from W. G. Smith, Hanamaulu, Kauai, with aneroid. The records formerly received from Kaneohe, Oahu, and from Kula, Maui, have been discontinued. These observations made away from the central station at Honolulu, are mainly useful in determining the direction of movement of atmospheric disturbance in this portion of the Pacific Ocean. It would appear that excepting in midsummer these are largely from the westward, and the observations of temperature changes on the different islands confirm the above. This is a very important question in general meteorology.

The following observers of rainfall furnish also memoranda of wind directions, and in some cases of force of wind:

Rogers at Pepeekeo, Hawaii;
Ross at Puna, Hawaii;
Rycroft at Puna, Hawaii;
Notley at Hamakua, Hawaii.
Lyons at Waimea, Hawaii;
Davis at Kealakekua, Hawaii;
Isenberg at Lihue, Kauai.

Rogers of Pepeekeo also furnishes a report of the state of the sea by recording the amount of surf breaking on the coast by a scale of numbers similar to that used for the force of the wind. The same observer also keeps a memorandum of earthquakes.

The full record at the central station at Punahou, Honolulu, has been kept up, making in all eleven years of said record. Five observations daily are made. These include air-pressure and temperature, humidity, cloud amount, kind and direction, wind direction and force, and rainfall.

PUBLICATION.

The full detailed Record for 1892 of the central station was published and sent abroad with the monthly means and rainfall for outside stations, and copies also furnished to travelers and others. The Record for 1893 has not yet been published. It should be done at an early period, as a number of foreign observatories and institutions wish the same for study and reference. As has been said above the monthly rainfall is published in local papers. There is also furnished weekly to the same papers an abstract from the general record of the previous week, partly for information, and partly to enable ships and strangers in port to compare their readings, especially of the barometer with a standard. Both thermometers and barometers are brought to this office for comparison, and it is important that the Government in a port like this should have a reliable standard.

Manuscript reports have been sent to the Australian Weather Bureau to aid in the publication of the South Pacific Weather Chart by the said Bureau, and also to the U. S. Hydrographic Office for the newly prepared North Pacific Pilot Chart. With the growth of commerce the demand for this matter increases.

In the way of increasing the store of past records for reference the entire weather record of Dr. Robert McKibbin, of Honolulu, from 1875 to 1890 inclusive, has been copied in permanent form, that gentleman having kindly loaned the same for that purpose.

TIDE-GAUGE.

The Tide-Gauge record is intimately connected with the meteorological work and is under the same management. This has been kept up continuously, and the individual sheets have been taken off and reduced daily by Mr. Christopher Willis of the Survey Office, so that the work is always kept up to date, which is more than can be said of the meteorological work. Especial care is given to determining the mean sea-level for each day in the year. Tracings of the tidal record reduced so as to be ready for use, are sent each month to the Coast and Geodetic Survey at Washington, U. S., and this office has been notified that the Tide Tables for Honolulu will be calculated and appear in the Pacific Coast Tide Tables for the year 1895. Those furnished by this office to the local papers are found by actual comparison with the subsequent record to be sufficiently accurate for practical purposes. The comparison is kept on file.

The time observations of this office have been kept up with daily chronometer and clock records, and the Greenwich time furnished for chronometers both for ships and for watchmakers in town, as well as the local time for the public in general. I would suggest it would be well for this port to maintain a "time-ball" in addition to the present Greenwich time whistle, which though more accurate than is generally supposed, fails of giving perfect satisfaction.

The appropriation asked for this division of the Survey Bureau is for expenses of publication, for clerical assistance,

and for the purchase of a few additional instruments necessary to keep this service in accord with larger ones abroad. It may be remarked that at some future time, when circumstances will warrant, the performance of the duties indicated above should be separated from that of those involved in the care and responsibility of the records of the Survey Office, with a view to thoroughness and efficiency in both branches of service.

Respectfully submitted,

CURTIS J. LYONS,
Assistant in charge of Meteorology.

To Hon. W. D. Alexander,
Surveyor-General.

Honolulu, March 31st, 1894.

REPORT

ON

GOVERNMENT LANDS.

GOVERNMENT SURVEY OFFICE, March 31st, 1894.

W. D. ALEXANDER,

Surveyor-General.

SIR:—I submit herewith a statement in detail of all Government lands, with record of leases, estimates of areas and of value, nature and quality of land, &c. The difficulties in the way of an absolutely comprehensive and accurate report are however very great, and in some directions almost insurmountable. Uncertainty as to boundaries (principally in the mountainous unoccupied portions of the group), lack of positive knowledge of quality and adaptability of the soil in untried sections, and the imperceptible gradations by which the best land merges into indifferent, and indifferent into the almost worthless, make any report largely a matter of personal opinion rather than of scientific certainty.

The value of lands which serve, or may serve only as a source of water supply, is a matter of especial difficulty to compute.

With these limitations, however, I have summarized, to the best of my judgment, the statements of the detailed list with the following results:

The total area of the Government lands at this date, is approximately 821,316 acres. The total valuation of the same is estimated at $2,160,300.

The income from the same represented by leases, &c., as of March 31st, 1894, is $64,396 annually, or about $26,200 greater than shown by my last report of 1890.

Of the total amount from leases, &c., $11,443 is from rents of Government lands with buildings and structures thereon, as the old Armory building, Marine Railway, &c.

Of the total valuation about $295,000 is represented by lands occupied for Government purposes.

The estimates of values have been founded upon a consideration of rentals given, prices of land sold, appraisments formally made, &c.

The remaining Government interest in homestead lots has been deduced by subtracting from the appraised value of the same the amount paid by settlers on account of principal, as given in tabulated statement of Mr. J. H. Boyd of the Land Office.

The total area of Government land may be roughly classified as follows:

Rice land	80	Acres.
Valuable building lots (including Tantalus and Makiki lots)	320	"
Fish ponds, &c	850	"
Cane land	12,000	"
Homestead and other lots for settlement	14,168	"
Coffee land	25,000	"
Rugged, inaccessible mountain tracts	38,898	"
Forest lands (high)	200,000	"
Grazing lands of various quality	330,000	"
Barren lands of nominal value only	200,000	"
	821,316	

The distinction here drawn between the different classes of

land may be somewhat arbitrary, but it is founded, as far as possible on the manner in which lands in the islands are at present utilized. That classed as "cane land" is largely under lease and cultivation, principally on the island of Hawaii, and lies below an elevation of about 1,200 feet.

Under the head of "coffee land," has been classed various tracts principally on the Islands of Maui and Hawaii, between the elevations of 1,200 and 2,200 feet, and similar in general character to lands already taken up for coffee culture.

Under the head of "grazing land" has been included a wide variety of land, and many thousand acres would be suited to any rocky or dry land product, as sisal, &c. The "mountain forest lands," given as 200,000 acres, contain also a large area of fine soil, but at a higher elevation than that of most lands now under cultivation. Much of this forest tract and of that described as grazing land, would come within the limit of what might be called a corn-growing or temperate belt. Of the lands not now under lease, or under lease with a Government homestead reservation, I should judge that from 15,000 to 20,000 acres would be suitable for coffee cultivatino, and available for would-be purchasers or settlers. The lack of good roads to and through these Government lands is a serious drawback, however, to their use and development, and the advantages of a good road, as shown in the case of the Olaa lots in Puna, would undoubtedly be paralleled in the case of many of the Government tracts.

The demand for lease or purchase of Government lands during the period has been an active one, and the prices realized almost invariably good. From sales and from the effect of the Legislative Act of 1890, transferring to the Crown and to the Bishop Estate certain "unassigned" lands, the area of Government lands has been reduced about 40,000 acres be-

low the estimate of my report of 1890; the total valuation, however, has increased, substantiating the statment of that report that any error would be on the side of undervaluation, which statement may also be repeated in this report.

In considering the applications which are referred to this office for report and recommendation, the effort is always made to further the sale and settlement of small lots.

Such large tracts as have been recommended for sale or lease have in general been either wholly unsuited to settlement and cultivation, or have been subject to leasehold conditions by which the Government have reserved the right to lay out and dispose of arable land for homesteads, &c.

In the work of the office has been included during the period, the general record of all information regarding Government lands; reports on all applications for lease or purchase, with special reports and plans in matters of title and other Government interest. Duplicate tracings have been furnished for all Government sales and surveys and plans for issuing of grants, duplicates of these latter being also made for file in the Government Survey Office. Special surveys have also been personally made, and a considerable amount of time has been given to the information of parties inquiring verbally or by letter about Government lands.

I have the honor to be,
Your obedient servant,

J. F. BROWN,
Assistant in charge of Government Lands.

NOTE:—Since my report and general statement of valuation of Government lands made under date of March 14th to the Chief Clerk of the Interior Department, and embodied in his report on appraised values of Government property to the

Minister of Finance, a more minute and careful study has been made of individual tracts, with a result of a moderate increase in valuation as shown by this later detailed report furnished below.

J. F. BROWN.

HILO DISTRICT, HAWAII.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Makaoku	49	Rocky kula	399	$ 10 00	May 8, 1904	$ 5,000 00	Includes Cocoanut Island, &c. Lease 399 is for 1¼ acres only, on main land
Hilo Court House lot	1.32	Valuable building site	....	.....	.....	3,000 00	
Kaumana surveyed lots	1482.92	Agricultural lots	....	.....	.....	3,334 27	3 or 4 miles mauka of town of Hilo
Kaumana remainder	500	Rough, lava tract &c	....	.....	.....	300 00	The area of this remainder uncertain. The best land has been laid out in lots.
Kaiwiki Homestead lots	620	Arable homest'd land	....	.....	.....	4,920 70	Value given is remaining Gov't interest.
Kaiwiki mauka	1000	Hilo forest land	....	.....	.....	2,500 00	Unoccupied
Kaapoko (mauka section)	106	Cane land	449	520 00	Sept 16, 1901	4,160 00	Valued at 8 yrs rental
Kaapoko (makai section)	15	Cane land	459	85 00	April 3, 1908	680 00	Valued at 8 yrs rental
Kaieie Homesteads	56	Arable land	....	.....	.....	701 10	Remaining Governm't interest
Kaieie mauka	635	Cane and forest land	412	750 00	Dec 30, 1904	7,500 00	About 145 acres cane land
Kawainui	608	Cane and forest land	385	300 00	July 19, 1908	6,000 00	Probably 150 acres cane land (mauka)
Kulaimano	347	Cane land	411	2,380 00	Dec 26, 1904	19,040 00	Valued at 8 yrs rental
Kaupakuea, mauka	210	Cane and wood land	441	500 00	June 17, 1901	4,000 00	Valued at 8 yrs rental
Kaakepa	194	Principally cane land	408	400 00	Oct 17, 1899	3,200 00	Valued at 8 yrs rental
Honomu.—Kuhua tract	3000	Cane and coffee land	372	501 00	April 25, 1897	20,000 00	Probably 300 acres good cane land. 1600 acres good coffee land
Kaiwiki.—Wailea tract	5590	Cane, coffee, wood land	293	300 00	June 15, 1906	45,000 00	Probably 800 acres of cane land. 2000 suita-

HILO DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
							ble for coffee culture. This land in vicinity of Hakalau
Kamaee.....	2400	Cane, coffee &c.....	301	$ 200 00	Sept 8, 1896	$ 25,000 00	Probably 600 acres good cane land. 1000 acres good coffee land
Lepoloa.—Kauniho.....	308	Cane land.....	431B	150 00	Jan 1, 1897	12,000 00	About 250 acres cane land. Lease of Kauniho &c., made by Bishop Estate, and transferred to the Gov't. 2½ miles from Hakalau, N. W.
Opea.—Peleau tract.....	1100	Cane and forest lands	363	315 00	July 22, 1903	10,000 00	Probably 200 acres suitable for cane and 700 for coffee
Kahuku.....	308	Homestead lots.....				2,947 00	Value given is remaining Gov't interest
Piha.....	4250	Cane, coffee, forest...	442	250 00	Feb 10, 1912	10,000 00	Probably 200 acrs cane land, and 400 acres within coffee belt; the remainder forest land at considerable elevation
Waikaumalo.—Maulua tk	4000	Cane, coffee, forest...				12,000 00	Probably 800 acres in cane belt, and 1500 acres in coffee belt. The land is rough and cut by numerous gulches. Not at pres-

HILO DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Maulua.—Laupahoe'e tr't	3000	Principally cane land	460	$1,200 00	March 2, 1908	$ 40,000 00	ent under any lease Includes some wood land at upper end.
Papaaloa Forest tract....	10000	Coffee, wood land....	....	... .	....	15,000 00	2500 acres within the coffee belt. Lease 460 covers about 180 acres of this tract
Kuaia.—Paana tract.....	633	Homestead lots	....	.....	....	11,895 00	Value given is remaining Gov't interest
Kuaia.—Paana mauka....	100	Wood land.....	....	.....	.....	400 00	This estimate approximate only
Ookala.....	1360	Cane and wood land..	463	402 00	March 8, 1913	20,000 00	About 600 acres cane
Manawaialee.....							
Manawaialee mauka.....	1200	Wood land.....	....	.....	.....	3,000 00	200 or 300 acres might be suited for coffee
Hilo.—Totals.....	43073.24	.....	....	$8,263 00	.....	$291,578 07	.....

Of the total area given for Hilo District about 3,100 acres are comprised in Homestead and other lots laid out for settlement. About 7,000 acres lie in what may be called the cane belt from its altitude, &c., and 10,000 acres in the coffee belt. The remainder is principally dense forest at considerable elevation.

HAMAKUA DISTRICT, HAWAII.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires*	*Value.*	*Remarks.*
Kaapahu	102	Cane land	315	$ 80 00	Jan 18, 1897	$ 2,500 00	Below main Govt. road
Kaiwiki.-Kaala tract	2200	Cane, wood land	360	300 00	Oct 10, 1895	15,000 00	Probably 300 acres of cane land & 500 at suitable eleva'n for coffee
			397	150 00	May 2, 1919		
Hoea.—Kaao tract	2500	Cane, wood land	371	270 00	April 25, 1907	15,000 00	About 300 acres in cane belt, and 500 in coffee belt.
Paauilo	565	Homestead	....	.....	.....	2,243 88	Value given is remaining Gov't interest
Kaohe.—Papalele tract.	2500	Wood and coffee land	477	50 00	Sept 28, 1903	15,000 00	Lease 447 is for 50 acres
	.....	.....	479A	185 00	Feb 2, 1904		Lease 479A is for 185 acres.
	.....	.....	....	150 00	Tenant at will		Kukaiau Pl. Co., tenant at will of 1850 acres. Uncovered by leases 265 acres. Probably 1,500 acres or more of this tract is suitable for coffee.
Kaohe forest tract 2*	14500	Forest, moun'n graz'g	439	440 00	Sept 9, 1906	20,000 00	Gov't lease 439 covers 13,456 acres.
	.....	.....	66	62 25	Jan 10, 1909		Lease 66 is for 1,035½ acres. Some portion of this Kaohe forest tract 2 makai might serve for coffee planting. Can not be stated definitely.

HAMAKUA DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Kaohe tract 3*	38700	Mountain grazing	436	$ 305 00	Sept 9, 1901	15,000 00	On N. W. slope of Maunakea at high elevation. From 5,000 and 6,000 ft to 14,000.
Kaohe tract 4*	137200	Mountain grazing	451	310 00	Sept 9, 1906	10,000 00	High mountain and table land. Tract between Maunakea and Maunaloa.
Kaohe tract 5*	24250	Mountain grazing	452	320 00	Sept 9, 1906	10,000 00	From 5,000 to 14,000 feet elevation.
Hauola	207	Cane land	395	934 50	Feb 18, 1899	7,476 00	Valued at 8 yrs rental
Kainehe	267	Homestead lots	....	.....	.....	1,187 25	Remaining Gov't interest.
Kekualele	15	Cane land	....	.....	.....	500 00	Makai of Gov't road.
Kemau	11	.....	...	.....	.....	100 00	Small, at top of sea bluff.
Kaapahu	763	Homestead lots	....	.....	.....	5,311 00	Remaining Gov't interest.
Kaunamano	192	Homestead lots	....	.....	.....	2,200 50	Remaining Gov't interest.
Kaao.—Paalaea tract	1015	Principally cane land	419	4,900 00	April 10, 1906	30,000 00	Between Paauhau and Honokaa.
Nienie tract*	9000	Forest grazing	435	600 00	Sept 9, 1906	15,000 00	The forest tract lying above Honokaa (Ahualoa) homestead. 500 acres might be suitable for coffee at lower edge of this tract.
Ahualoa tract 1	682	Homestead lots	....	.....	.....	2,237 00	Remaining Gov't interest.

HAMAKUA DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Ahualoa tract 2	814	Homestead lots	....	.....	.....	5,550 00	Remaining Gov't interest.
Lauka	133	Cane land	406	695 00	Oct 1, 1899	5,560 00	Valued at 8 yrs rental
Au	163	Cane land	405	530 00	Oct 1, 1899	4.240 00	Valued at 8 yrs rental
Kaauhuhu	153	Homestead lots	....	.....	.....	1,528 50	Remaining Gov't interest.
Kapulena	1000	Forest grazing	....	.....	.....	3,000 00	
Hanapai	78	Cane land	361	100 00	Oct 14, 1895	2,500 00	Lies on both sides of Gov't road near Kukuihaele Plantation.
Kamoku	2600	Good grazing land	....	.....	.....	8,000 00	
Laupahoehoe.— Awini	13000	Rugged mountain	....	.....	.....	20,000 00	This is the rugged mountain and valley tract between Waimanu and Honokane. The estimate value is an arbitrary one put upon it as a source of future water supply. It is at present too inaccesible to be regarded as the site of agricultural enterprise.
Hamakua Totals	252610	.....	....	$10,381 25	.....	$219,134 13	.....

The sign * indicates a lease with homestead reservation.

Of the total area given for Hamakua District, about 2,500 acres are within the cane belt, largely cultivated: 3,500 acres are regarded as good coffee land. 3,436 acres, principally in the coffee belt, are homestead lots mostly taken up: 210,000 are regarded as grazing land, including the great Kaohe mountain tract: 20,174 acres are forest land, at higher elevation than at present considered suitable for coffee: 13,000 acres approximately is the rugged and inaccessible tract to the north of Waimanu valley.

KOHALA DISTRICT, HAWAII.

Name of Land.	Acres.	Nature of Land.	Lease No.	Annual Rental.	Lease Expires.	Value.	Remarks.
Kahea	560	Cane and grazing	223	$ 200 00	Nov 13, 1896	$ 12,000 00	Near Hind's mill. About 250 acres cane land.
Hualua	275	Cane and grazing	467	392 00		5,000 00	About 125 acres good cane land.
Hualua Homesteads	14	Homestead lots				328 00	226 acres were laid out in homestead lots but not taken up. Lease 467 covers the site of the unoccupied homestead lots.
Opihipau	449	Cane and grazing	426	314 30	Jan 27, 1901	3,000 00	Probably 100 acres of of cane land of fair quality.
Hukiaa	380	Cane and grazing	427	266 00	Jan 27, 1901	3,000 00	Probably 100 acres of cane land of fair quality.
Puuepa.—Kokoiki	399	Good grazing	478	75 00	Nov 29, 1903	1,200 00	
Awalua.—Haena	224	Good grazing	470	200 00	Aug 9, 1903	2,000 00	This is a good tract. Possibly cane land in part.
Kapaa makai	100	Dry rocky grazing				250 00	1½ miles north of Mahukona.
Puukole.—Koaeae	1400	Grazing land				3,000 00	This extends from shore to about 4 miles mauka. Upper portion good grazing land; lower portion dry rocky grazing.
Kohala.—"Pili lands"	9341	Dry grazing land	471	250 00	Aug 9, 1903	10,000 00	These lands are to the

KOHALA DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
							south of Mahukona extending about 6 miles along shore and running mauka from same, about 3 miles. Upper portion contains some good grazing land. Lower section very dry, rocky.
Various remants in L. 390	679	Grazing land.....	390	150 00	Oct 4, 1898...	1,200 00	Valued at 8 yrs rental
Lahikiola.....	80	Grazing land.....	391	25 00	Oct 4, 1898...	500 00	
Lamaloloa.— Makeanehu	45	Grazing land.....	....	.....	.....	200 00	Two small remnants.
Makiloa.....	328	Good grazing.....	423	50 00	Oct 15, 1905..	700 00	
Lanikepu (S. Kohala)...	450	Grazing, wood land ..	....	.....	.....	1,500 00	
Pauahi (S. Kohala).....	650	Grazing, arable land..	....	.....	.....	2,500 00	566 acres laid out in lots for settlers. Not yet taken up.
Court House lot, Waimea	1	.....	....	.....	.....	100 00	
Kohala totals	15375	.....	....	$ 1,922 30	.....	$ 46,478 00	.....

The total area of Government land in Kohala may be classified:—500 acres cane land, 664 acres laid out for settlement, 500 acres woodland, about 14,000 acres grazing.

NORTH KONA DISTRICT, HAWAII.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Puuanahulu	83000	Rocky grazing	206	$ 150 00	Nov 20, 1895	$ 12,000 00	Largely made up of rough lava tract &c., but with a small proportion perhaps 1000 to 2000 acres of fairly good land. This tract lies on the north slope of Hualalai.
Kukio.—Awakee	3485	Rocky grazing				447 00	Appraised by Commissioners.
Akahipu tract	262	Fruit and coffee				650 00	Appraised by Commissioners
Kaulana homesteads	551	Homestead lots				1,341 00	Remaining Govt interest.
Awalua.—Ohiki tract	4135	Rocky grazing land				900 00	Appraised by Commissioners.
Puukala	158	Grazing land				158 00	Appraised by Commissioners.
Makaula	185	Barren lava, &c				30 00	
Kohanaiki.—Ooma	779	Homestead lots				2,321 00	Remaining Gov't interest.
Makaula (lots 17-25)	30	Fair Coffee land				91 00	Appraised by Commissoners.
Ooma, mauka tract*	1208	Coffee, wood land &c.	432	60 00	Aug 1, 1906	3,500 00	Lease 432 is for 1160 acres of this tract. Gov't right to lay out homesteads reserved in lease.
Kealukehe lots	413	Homestead lots				1,262 00	Remaining Gov't interest.

NORTH KONA DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Kealakehe makai	1659	Very rocky grazing		$		$ 500 00	
Kealakehe forest	1800	Wood land &c				3,000 00	Most of this at high elevation. Probably 150 acres within coffee belt.
Honuaula tract	5400	Forest and mountain grizing				5,000 00	Area given is approximate. The elevation of this tract is probably too great for coffee.
Laula	44	Coffee &c				300 00	
Honalo	920	Wood land, coffee &c	447	75 00	May 25, 1902	2,000 00	Probably 150 acres good coffee land. The lease 447 is for 710 acres mauka end.
Puaa	34	Homestead lots				26 00	Remaining Gov't interest.
North Kona totals	104063			$ 285 00		$ 33,526 00	

The sign* indicates lease with homestead reservation.

SOUTH KONA DISTRICT, HAWAII.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Keopuka	40	Good coffee land		$		$ 250 00	Small piece above Gov't road.
Kauleoli	15					75 00	
Waiea	1350	Forest tract				2,500 00	Probably 200 acres suitable for coffee.
Kalamakowali	208	Homestead lots				760 00	Remaining Gov't interest.
Haukalua.—Alae tract	1300	Forest tract	472	55 00	Aug 17, 1894	2,000 00	About 200 acres suitable for coffee.
Kaohe	850					1,500 00	About 100 acres suitable for coffee.
Kukuiopae	3600	Forest tract				5,000 00	
Kukuiopae lots	111	Homestead lots				353 00	Remaining Gov't interest.
Olelomoana Opihihale	3400	Rocky grazing and forest land				5,000 00	Probably a limited quantity (a few hundred acres) suitable for coffee, areas approximate.
Olelomoana lots	475					2,893 00	Remaining Gov't interest.
Kipahoehoe.—Alika	7500	Rocky, grazing, forest				5,000 00	There is no data upon which any estimate can be made of arable land in this tract but the same is probably very limited.
Hoopuloa tract*	1200	Forest land		50 00	Aug 19, 1906	3,000 00	The area given is rough estimate only.

SOUTH KONA DISTRICT, HAWAII.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
						$	Probably 100 or 200 acres of good quality.
Okoe	1000	Barren lava, wood and small quantity of coffee land	....	.....	.....	1,000 00	Boundaries only partially surveyed. Area given is a rough estimate only.
Kaulanamauna	3400	Principally dry	....	.....	.....	1,500 00	On the border of Kona district joining Kau.
South Kona totals	128507	.....	....	$ 390 00	.....	$ 64,357 00	.....

The sign * indicates lease with homestead reservation.

The total area of lands in Kona may be classified as follows:—Homestead lots, 2566 acres; good coffee land, 1676 acres; forest land at considerable elevation, 25000; rocky grazing land, 79260; barren lava tracts, 20000 acres.

KAU DISTRICT, HAWAII.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires*	*Value.*	*Remarks.*
Manuka	22800	Dry grazing and wood		$		$ 7,500 00	End of Kau district adjoining Kona. A very small proportion fit for homesteads.
Keaa.—Mohowae	1195	Dry grazing and wood					
Kamaoa.—Pueo	12500	Dry grazing	458	500 00	April 25, 1907	12,500 00	South point of Hawaii
Pumakaa Kiolokaa	7765	Grazing, wood land				7,500 00	
Kawala Kaunamano	2880	Cane, wood land &c.	420	600 00	Oct 22, 1905	20,000 00	About 400 acres cane land
Hionaa	1332	Grazing and wood	421	150 00	Jan 10, 1906	3,000 00	
Kaalaiki	11600	Grazing and wood	299	120 00	Sept 8, 1906	10,000 00	About 120 acres cane land.
Mohokea*	2761	Cane, grazing, wood	454	550 00	June 4, 1907	8,000 00	Probably 200 acres cane land.
Ninole.—Wailau lots	883	Homestead lots				4,941 00	Remaining Gov't interest
Ninole.—Wailau forest	6500	Wood land	429	150 00	June 17, 1906	7,000 00	A few acres only cane land.
Moaula.—Makaka	11900	Cane, wood land &c.	297	275 00	June 15, 1906	20,000 00	About 500 acres cane land.
Kaauhuhuula	2700	Grazing, wood land				5,000 00	
Kaalaala	16900	Grazing, wood, cane	461	250 00	Jan 1, 1903	25,000 00	About 300 acres cane. Lease 461 is for 2964 acres of this tract.
Kau totals	101716			$ 2,595 00		$130,441 00	

The sign * indicates a lease with homestead reservation

The total area of Gov't land in Kau may be divided approximately as follows:—Homestead lots, 883 acres; cane land, 1500 acres; high forest and mountain land, 45,000 acres; rocky grazing land, 54,333 acres

PUNA DISTRICT, HAWAII.

In the incomplete state of the survey of the Puna District, any estimates are made with a very large element of uncertainty. The total area of Government land is probably not far from 40,000 acres; of which 1,607 acres have been laid out for homestead lots, the interest of the Government in the same on account of purchase price not yet paid up being $7,688 00.

The remaining Government land varies widely in quality, from that of good arable land to the most barren lava.

Assuming 1-10th only of this land to be of good arable quality, and considering the widely divergent character of the remainder, an estimate of value has been made at the sum of $45,000 00.

There is but one lease (431c) on the land of Keekee at $25 00 per year, expiring January 1st, 1906. This land and the unexpired lease having been transferred to the Government by the Bishop Estate.

DISTRICTS IN THE ISLAND OF MAUI.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
LAHAINA.							
Puuike	659	Grazing				$ 2,000 00	Above Laina.
Court House lot	2	Building site				3,000 00	Occupied by Gov't.
Pelekane lot	1.92	Old taro and kula	319	30 00	May 13, 1902	300 00	Lease is for a small portion near wharf.
Prison lot	.80						
WAILUKU.							
Court House lot	.68					300 00	
Hospital lot	2					500 00	
Kou (Waiehu)	611	Cane and grazing	382	260 00	June 14, 1898	7,500 00	Probably 150 acres of cane land.
Kapoino	30.86	Cane and taro				2,500 00	
HONUAULA.							
Kanaio	7650	Grazing and rocky	430	300 00	June 17, 1901	5,000 00	
Papaka.—Kalihi	300	Grazing and rocky				400 00	
Kualapa	400	Grazing and rocky				500 00	
Kanahena	1034	Grazing and rocky	350½	75 00	Mar 1, 1894	600 00	
Onau.—Moopilo	600	Grazing and rocky				1,260 00	13 scattering pieces.
Papaanui	4500	Grazing and rocky				2,000 00	Much of this of nominal value only.
Totals	15792.26			$ 665 00		$ 25,860 00	

Of the total area of Government land in above Districts, about 181 acres is cane land; 8 acres small town lots; 15,603 acres grazing land.

DISTRICTS IN THE ISLAND OF MAUL—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
KULA.							
Kamaole	4360	Rocky grazing	407	$ 710 00	July 3, 1899...	$ 5,680 00	Valued at 8 yr rental
Waiakoa lots	870	Homestead lots	....	.....	.....	2,832 00	Remaining Gov't interest.
Waiakoa makai	2740 00	Grazing land	425	620 00	Feb 9, 1901...	5,000 00	.....
Waiakoa mauka	1800 00	Grazing land	424	125 00	Feb 9, 1901...	3,000 00	.....
Pulehuiki, Kamehameiki	720	Homestead lots	....	.....	.....	2,145 00	.....
Alae	840	Grazing land	368	450 00	April 25, 1902	3,600 00	8 years rental
Keahua	28	Grazing land	415	70 00	May 19, 1900..	300 00	.....
Omaopio makai	1934	Grazing land	416	730 00	May 19, 1900..	6,000 00	.....
Omaopio central	29	.....	....	.....	.....	150 00	.....
Totals	13321	....	....	$ 2,705 00	.....	$ 28,707 00	.....

Of the total area of Government land in Kula, 1,590 acres of the best land are Homestead lots. The remainder, 11,731 acres are grazing land.

DISTRICTS IN THE ISLAND OF MAUI.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
HAMAKUAPOKO.							
Makawao	4549	Grazing and wood..	188 211	$ 450 00 25 00	Jan 1, 1905. Jan 1, 1905.	$7,200 00	Lease 188 was to the Board of Education at a nominal rental. Sublet by the Board of Education, and half the rent received paid to the Gov't....
Court House lot	.96					200 00	Occupied by Gov't
Paia lot	.50					100 00	
Hamakualoa tract	9000	Forest, mountain..	475 267B	5,000 00 500 00	Sept 30, 1916 July 8, 1908	50,000 00	2000 acres of this tract might be suitable for coffee. The leases are for water rights
Hanauana	50	Grazing or arable				250 00	These remnants situated makai of the main Gov't road. It is designated grazing land but might be of good quality for coffee
Hoalua	20	Grazing or arable				100 00	
Honakala	35	Grazing or arable				175 00	
Honopou	70	Grazing or arable				350 00	
Hoolawa	30	Grazing or arable				150 00	
Papaaea	50	Grazing or arable				250 00	
Totals	13805.46			$ 5,975 00		$ 58,775 00	

Of the total area of 13,805 acres, 3000 might be considered coffee land. The remainder, 10,805 acres is mountain forest land, principally valuable for water supply.

DISTRICTS IN THE ISLAND OF MAUI.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
KOOLAU.							
Pahoa.—Pauwalu	1500	Mountain forest				$ 1,500 00	Includes Puuolu fish pond.
Koolau forest	15500	Mountain forest				15,500 00	From 1000 to 2000 acres might be suited to cultivation. The country is rough, cut by numerous deep gulches etc. Water rights are included in the leases given under head of Hamakualoa.
HANA.							
Makapuu	700	Rocky grazing				700 00	
Honomaele tract	1000	Rocky grazing	474	$ 100 00	Aug 19, 1908	1,000 00	
Wakia	1115	Rocky grazing	398	100 00	May 2, 1899	1,500 00	
Kawaipapa	450	Rocky grazing	362	25 00	Apl 1, 1896	500 00	Includes about 6 small fish ponds. Lease 362 is for three water holes.
Kakio	1060	Grazing	326	100 00	Oct 16, 1902	800 00	8 years rental.
Papahawahawa	301	Grazing	328	45 00	Nov 1, 1902	360 00	8 years rental.
Hana forest tract	14000	Mountain forest	479B	75 00	Dec 5, 1913	10,000 00	Lease 479B is for a portion of this, 600A. Perhaps 1000 acres might be classed as coffee land.
Totals	35626			$ 445 00		$ 31,860 00	

The Koolau and Hana Districts comprise a total area of 35,626 acres, divided as follows;—Coffee land, 3,000 acres; high forest etc., 2,800 acres; grazing land, 29,826 acres.

DISTRICTS IN THE ISLAND OF MAUI.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
KIPAHULU.							
Paupauluna &c.....	156	Cane and grazing	476	$ 168 00	Nov 1, 1898...	$ 1,344 00	8 years rental. About ½ cane land.
Kipahulu forest.....	1000	Mountain forest.....	....	.....	.....	2,000 00	.....
KAUPO.							
Kaniaula..... Alaakua.....	1500	Rocky grazing.....	....	.....	.....	1,000 00	.....
Naholoku tract....	800	Barren grazing	....	.....	.....	500 00	A very high elevation
Kaupo lots, remnants....	216	Grazing.....	....	.....	.....	450 00	.....
Nakula tract.....	1500	Grazing.....	409	105 00	Sept 19, 1899 .	1,400 00	.....
Nakula mountain tract..	3900	Grazing.....	434	30 00	Aug 27, 1900 .	1,000 00	At very high altitude on Haleakala.
Totals	9072	.....	....	307 00	.....	$ 7,694 00	.....

The Government land in Kipahulu and Kaupo have a total area of 9,072 acres approximately, nearly all of which is rocky grazing land, and much of which is at a very high elevation.

Kahikinui.....	2500	Grazing land.....	422	$ 3,010 00	Feb 1, 1901...	$ 2,500 00	Includes part of Haleakala crater. Makai part good grazing land.

The whole District of Kahikinui belongs to the Government with the exception of the land of Auwahi and a few grants. The country is dry and rocky but is valuable grazing land.

ISLANDS OF LANAI AND KAHOOLAWE.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
LANAI.							
Mahana	7973	Grazing	220	$ 100 00	Nov 1, 1907	$ 8,000 00	
Kalulu	5945	Grazing				6,000 00	
Kaunolu	7433	Grazing	279	250 00	Feb 9, 1907	7,500 00	
Kealia.—Paauili	6281		168	150 00	June 23 1908	6,000 00	
Kamao	2715					2,500 00	
KAHOOLAWE.	30000	Grazing	115	250 00	Jan 1, 1913	15,000 00	
Totals	60347			$ 750 00		$ 45,000 00	

The Government lands on Lanai and Kahoolawe are almost wholly dry grazing lands.

ISLAND OF MOLOKAI.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Hoolehua lots.....	142	Homestead lots.....	....	.....	.....	$ 675 00	Remaining Gov,t interest.
Hoolehua tract...	3736	Grazing land.....	....	.....	.....	4,000 00	....
Punalau.....	89	Old fish pond &c.. ...	....	.....	....	100 00	Along shore west from Kaunakakai.
Kamiloloa lots.....	180	Homestead lots.....	....	.....	.....	325 00	Remaining Gov't interest.
Kamiloloa mauka	1273	Grazing land.....	....	.....	.....	1,100 00	.....
Makakupaia.....	1216	Grazing land.....	....	.....	.....	900 00	.....
Makolelau.....	2087	Grazing land.....	....	.....	.....	1,500 00	Joins lands of Kawela.
Kahananui.....	282	Grazing land.....	....	.....	.....	500 00	In two sections.
Leper settlement lands..	4000	.....	....	.....	.....	8,000 00	Purchase price.
Wailau.....	2000	Grazing and mountain	....	.....	.....	4,000 00	.....
Various scattered lots...	5000	Grazing and mountain	....	.....	.....	4,000 00	Rough estimate of remaining pieces.
Totals.....	20005	.....	....	.....	.....	$ 25,100 00	.....

The Government land at Molokai may be classified as follows:—Grazing land, 13,594 acres; Leper Settlement lands, 6,000 acres; Homestead lots, 322 acres; old fish ponds &c., 89 acres.

ISLAND OF OAHU.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
WAIKIKI.							
Kaaumoa	1.97	Rice land	341	$ 700 00	June, 1903	$ 5,600 00	Value at 8 yrs rental.
Kalia	22.22	Rice land					
Kaluaolohe	1.49	Rice land					
Mookali	24.57	Rice land					
Kapuna	.53	Rice land					
Waika	11.20	Rocky kula	....	.....	.....	1,000 00	On road by Kamoiliili church.
Kapahula	729	Rocky kula	....	.....	.....	3,300 00	Diamond Head tract. Value given is the purchase price.
PALOLO.							
Kepuhi	11.25	Rice and kula land	462	75 00	April 3, 1908	1,500 00	About 5 acres rice land.
Kaauwaeloa	18.84	Rice and kula land	446	200 00	May 18, 1907	2,000 00	About 7 acres rice land.
MANOA.							
Kaluaalaea &c	700	Rough mountain tract	700	.....	.....	3,500 00	Head of Manoa Valley
Waahila	197	Grazing land	404	200 00	.....	1,600 00	On ridge between Manoa and Palolo.
Pahao (2 lots)	19.40	.....	....	.....	.....	543 00	.....
Pahao lease	30	Grazing land	465	25 00	April 1, 1908	1,500 00	On east slope of Round Top.
Kahoiwai	18.80	Grazing land	438	75 00	Nov 18, 1901	600 00	.....
Waaloa	12	Grazing land	....	.....	.....	300 00	.....

ISLAND OF OAHU.—Continued.

Name of Land.	Acres.	Nature of Land.	Lease No.	Annual Rental.	Lease Expires	Value.	Remarks.
MAKIKI.							
Tantalus and Makiki ridge lots	151	Mountain ridge etc. for summer reside'e.				$ 16,000 00	Lots laid out on line of Tantalus road.
Makiki new lots above Wilder avenue	27	Building lots				7,065 00	This includes the lands purchased and reserved for benefit of Honolulu Water Works in Makiki Valley on adjoining ridges.
Makiki Valley etc	1022					35,330 00	
NUUANU.							
Laimi	46	Grazing				1,100 00	Opposite the old ranch of J Wood.
Luakaha	87.50	Grazing and arable				2,400 00	Purchase price.
Hanaiakamalama	9.80	Building site etc				8,000 00	The "Queen Emma" lot, Nuuanu. Value given is the purchase price.
Alewa	174	Grazing land	384	$ 165 00	June 21, 1896.	1,320 00	On ridge between Nuuanu and Kapalama.
Kahapaakai	10.30	Grazing and taro				500 00	Purchase price.
Reservoir site (new)	4					700 00	Purchase price.
Electric light station	3.93	Building site				390 00	Purchase price.
Puiwa reservoir site	.25					200 00	Purchase price.
Lot at end of Judd st						78 00	
Reservoir site (Queen Emma's)	10					500 00	Purchase price.

ISLAND OF OAHU.—Continued.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
KAPALAMA.							
Insane Asylum land	13.66	Taro and kula land	....	.....	.....	$ 4,500 00	Purchase price.
Kunawai spring	1.12	.....	....	.....	.....	.....	Subject to numerous water rights.
Kawili, loko 1	10.50	Old fish pond	379	$ 162 00	.....	3,000 00	By railroad terminus.
Kawili, loko 2	17.70	Old fish pond	....	.....	.....	1,000 00	Makai of rice fields, Kapalama.
KALIHI.							
Kaluaopalena makai	20	Grazing and arable	....	.....	.....	2,500 00	Near Adams' Garden.
Kaluaopalena lots (3)	2.53	Building lots	....	.....	.....	502 00	.....
Kaluaopalena mauka	75	Grazing land	403	116 00	July 3, 1899	1,200 00	.....
Maohia	76	Grazing and mountain	....	.....	.....	1,000 00	At extreme head of Kalihi Valley.
MOANALUA.							
Kaihikapu Lelepaua	742	Fish ponds	445	1,500 00	May 18, 1907	1,200 00	.....
EWA.							
Manana iki	5.45	Rice land	417	85 00	July 24, 1900	1,000 00	.....
Waimano	2630	Grazing and mountain	455	459 00	Aug 22, 1902	5,000 00	.....
WAIANAE.							
Kahanaiki Makua Keawaula ½	690 2628 330	Grazing	113	225 00	Feb 12, 1910	7,000 00	.....

ISLAND OF OAHU.—Continued.

Name of Land.	Acres.	Nature of Land.	Lease No.	Annual Rental.	Lease Expires.	Value.	Remarks.
WAIALUA.							
Mokuleia			365	$ 55 00	Apl 21, 1897		
Kealia		Rocky grazing and					
Kawaihapai	14000	mountain land	70	200 00	Dec 20, 1910	$ 14,000 00	Area is approximate only. Lease 70 is for Kuokala portion.
Kuokala							
KOOLAU.							
Kaipapau	160	Grazing land	450	50 00	June 15, 1912.	600 00	
Apuu (Waiahole)	.18	Rice land					
Kaaniu (Waiahole)	24.10	Rice and kula land.	431	200 00	Dec 1, 1901	2,000 00	
Kuaiokumu	7	Rice and kula land.					
Kumupali (Waiahole)	.57	Rice land					
Kupapaulau (Waiahole)	1.55	Rice land				500 00	
Makanilua							
Poahamai	128.64	Rice and kula				1,200 00	
Kualele							
Kanohoanahopu	7	Rice and kula	473	25 00	Aug 17, 1908	500 00	Lease 473 is for 1 4-10 acres of this-
Oahu totals	24904			$ 4,517 00		$152,528 00	

Total area of Government land on Oahu, (exclusive of Honolulu lots) 24,904 acres which may be classed as follows; grazing land, 22,000 acres; rice land, 80 acres; fish ponds, 760 acres; building lots, (Tantalus ridge etc., included) 200 acres; forest mountain land, 1,864 acres mostly reserved for protection of forests, water supply etc.

GOVERNMENT LOTS IN HONOLULU.

Under this head are included the valuable lots in Honolulu, exclusive of the esplanade and city front. Most of these lots being occupied by the Government. The total area of such lots is about 53 acres and the value estimated at $269,100

The esplanade and water front tract contains about 52 acres. There seems no special reason for changing the estimate made in former reports, viz: $650,000.

The income from the above tracts by the various leases, etc. now in force would be $21,966 annually. Of this amount about $11,443 is from rent of Government land with buildings and structures thereon; as Marine Railway, Old Armory, etc.

ISLAND OF KAUAI.

Name of Land.	*Acres.*	*Nature of Land.*	*Lease No.*	*Annual Rental.*	*Lease Expires.*	*Value.*	*Remarks.*
Olohena.	1151	Grazing & cane land.	....	.....	.....	$ 5,000 00	Probably from 300 to 400 acres of land good for cane if supplied with water.
Kamamaloo	2405	Grazing, cane with mountain forests &c.	268	$ 300 00	Mar 29, 1899..	15,000 00	Probably 400 acres good cane land.
Papaa.	2000	Wooded mountain....	443	100 00	Feb 10, 1912..	2,000 00	Valnable for water supply.
Waioli	3100	Gazing, rough moun'n	....	.....	.....	4,000 00	In Hanalei Valley region. About 500 acres makai is in the nature of grazing land, possibly suited to cultivation. The total area is rather uncertain.
Napali	13400	Rugged mountain....	453	55 00	July 7, 1917 ..	5,000 00	This tract is very inaccessible, unsurveyed. Approximate estimate only.
.....	.....	.....	345	25 00	July 1, 1913 ..	.....	.....
Kauai totals.....	22056	.....	....	$ 480 00	.....	$ 31,000 00	.....

Of Kauai Government land, about 600 acres estimated as cane land; 3,556 acres estimated as grazing land, 4,500 acres, forest mountain land; 13,400 acres, rugged inaccessible Napali mountain tract.

REPORT

OF THE

MEDICAL SUPERINTENDENT OF THE INSANE ASYLUM.

HONOLULU, March 31st, 1894.

TO HIS EXCELLENCY JAMES A. KING,

Minister of the Interior,

SIR:—I have the honor to present to you my report of the Insane Asylum for the biennial period ending March 31st, 1894.

Number of patients remaining in the Asylum March 31, 1892		75
Number of patients admitted during the period		75
Escaped patient returned		1
Total		151
Number of patients discharged during the period	56	
Number of patients died during the period	25	81
Remaining in Asylum March 31st, 1894		70

NATIONALITY OF PATIENTS ADMITTED DURING THE PERIOD.

Nationality.	*Male.*	*Female.*	*Total.*
Hawaiian	19	9	28
Japanese	13	2	15
Chinese	12	1	13
Portuguese	2	5	7
English	4	1	5
United States	3	0	3
German	2	0	2
Danish	1	0	1
Chilian	1	0	1
Recaptured.			
Portuguese	1	0	1
Total	58	18	76

NATIONALITY OF PATIENTS DISCHARGED DURING THE PERIOD.

Nationality.	*Male.*	*Female.*	*Total.*
Hawaiian	11	7	18
Japanese	14	2	16
Portuguese	2	5	7
Chinese	3	0	3
S. S. Islands	3	0	3
English	2	0	2
United States	2	0	2
German	2	0	2
Chilian	1	0	1
Total	40	14	54.

Length of Residence of Patients Discharged during the Period.

Under 1 month	2
Under 3 months	16
Under 6 months	17
One year	11
Two years	5
Three years	2
Seven years	1
Total	54

Nationality of Patients Remaining.

Nationality.	*Male.*	*Female.*	*Total.*
Chinese	19	1	20
Hawaiian	15	4	19
Portuguese	10	2	12
United States	4	1	5
German	2	1	3
S. S. Islands	3	0	3
English	0	2	2
Norwegian	2	0	2
Japanese	1	0	1
Manila	1	0	1
Central American	1	0	1
East India	1	0	1
Total	59	11	70

LENGTH OF RESIDENCE OF PATIENTS REMAINING IN THE ASYLUM.

Under 1 month	2
Under 2 months	1
Under 6 months	4
One year	4
Two years	10
Three years	4
Four years	4
Six years	4
Seven years	4
Eight years	6
Nine years	4
Ten years	4
Eleven years	4
Twelve years	3
Thirteen years	3
Fifteen years	3
Sixteen years	2
Twenty years	2
Twenty-two years	1
Twenty-four years	1
Total	70

I have the honor to be,

Your obedient servant,

A. McWAYNE,

Medical Superintendent Insane Asylum.

REPORT

OF

THE BOARD OF FIRE COMMISSIONERS.

HONOLULU, March 31, 1894.

TO HIS EXCELLENCY J. A. KING,

Minister of the Interior.

SIR:—The Board of Fire Commissioners of the City of Honolulu herewith present to Your Excellency their annual report for the year ending March 31st, 1894, containing a statement of the expenditures of the Department for the said period. Also, the report of Chief Engineers Frank Hustace and Jas. H. Hunt, the former for the six months ending August 31st, 1893, and the latter to March 31st, 1894, showing the condition of the Department, a statement of the fires and alarms and their causes, and other information pertaining to the Department.

ORGANIZATION.

The Fire Department as now constituted consists of a Board of Fire Commissioners who act without compensation, a Clerk, a Chief Engineer, one Senior Foreman, one Foreman, two Engine Companies, one Hose Company, comprising a force of twenty-one uniformed men in all grades and positions.

BOARD OF FIRE COMMISSIONERS.

Andrew Brown, President;
Hugh Gunn,
Geo. W. Smith,
Geo. Manson, Clerk.

APPROPRIATIONS.

The balance of the appropriations for running expenses of the Honolulu Fire Department, Mar. 1, 1893, was	$23,630 01
Amount of new appropriation, voted Feb. 8, 1894	2,600 00
Amount of special appropriation for Engine Cos. Nos. 1 and No. 2	2,000 00
Total appropriations	$28,230 01

EXPENDITURES.

Amount expended for running expenses	$26,052 70
Amount expended from appropriation for Engines Nos. 1 and 2	1,600 56
Unexpended balance of running expenses	177 31
" " Engines Co. Nos. 1 and 2.	399 44
	$28,230 01

RECAPITULATION OF EXPENDITURES.

Paid services rendered on organization	$ 180 00
Pay rolls	17,063 20
Apparatus (new)	798 26
Apparatus (repairs)	292 60
House repairs	565 41
Horses	1,530 00
Horse feed	1,326 45
Horse shoeing	231 50
Harness and repairs	370 80
Fuel	52 00
Rent of houses	1,182 50
Telephone service	484 40

Stores and supplies	1,098 62
Aid to Company No. 5	600 00
Improvements Fire Police Hall	374 77
Rent Fire Police Hall	490 00
Bedsteads and furniture	283 50
Hydrant posts, etc	82 00
Rules and printing	54 75
Service badges	125 25
Purchase No. 2 flag pole	50 00
Hack hire	10 00
Use of horse	20 00
Volunteer Fire Department (Sundry bills)	386 25
	$27,653 26

VALUATION OF PROPERTY.

The total valuation of property of all kinds held in trust by the Board of Fire Commissioners is as follows:

3 Engines, complete	$17,214 20
Chemical Engine	2,893 60
1 One-horse Hose Cart	792 85
1 Two-horse Horse Cart	772 53
1 Hook & Ladder Truck (new)	465 18
1 Hook & Ladder Truck (old)	500 00
Hose	8,387 50
7 Horses	1,430 00
Harness, complete with hangers	1,171 85
Houses and lots of Engine Co.'s No. 1 and 5	15,000 00
2 old two-wheel Hose Carts	100 00
5 pieces Suction Hose, 4½ and 2½	222 00
1 new Boiler at Warehouse	858 44
Miscellaneous	2,849 00
	$52,657 15

HILO FIRE DEPARTMENT.

Engine, complete	$ 5,030 10
Hose Cart and Hose	625 00
1 Coal Truck	259 00
Miscellaneous	175 75
Valuation of property of Hilo Fire Department	$ 6,089 85
Valuation of property of Hon. Fire Department	52,657 15
Total	$58,747 00

REPORT OF CHIEF ENGINEER F. HUSTACE.

OFFICE OF CHIEF ENGINEER H. F. D.

MR. ANDREW BROWN,

Chairman of Board of Fire Commissioners.

DEAR SIR:—In accordance with Section 2, Act 17 of the Provisional Government, I now present you with the first semi-annual report from March 1st to September 1st, 1893.

During the said time two stalls have been provided with store-room, also accommodations for men at Engine No. 1, and a new team of black horses has also been purchased for said company.

A new Hose Wagon has been imported, and a Hose Company formed with the two horses (formerly the property of Engine Co. No. 1.) The said wagon carries two Babcock's Fire Extinguishers, also 750 feet hose, which adds to the efficiency of the Department.

Also, through the energy of yourself as Superintendent of Water Works, standing hydrants have been placed in places that required better protection than was supplied before you took office.

FIRE ALARMS.

During the six months there have been a total of 19 alarms as follows:

Children playing with matches	2
Lamp upset	2
Rubbish	1
Unknown	3
Saltpetre	1
Straw	2
Bedding	2
Smoking	2
Electric Light wire	2
Defective smokestack	1
Fake	1
Total	19

FIRES ACCORDING TO WARDS.

Ward.	*Fires..*	*Ward.*	*Fires.*
1	2	7	2
2	2	8	2
3	2	9	1
4	2	10	2
5	1	11	2
		13	1

Total within fire limits	4
Total outside fire limits	15
Total active service fires	4
Total service not needed fires	15

COMPANY DRILLS.

Drills have been held regularly three or four times a week, which has been the means of making the men very efficient on making connections.

LOSSES BY FIRE INSURANCE, PAID.

Total losses in 19 fires	$2,944 45
Total losses paid	2,794 45
Total amount of insurance	8,600 00
Total amount not covered by insurance	150 00

CONDITION OF APPARATUS.

The engines and other apparatus of the Department are in a first-class serviceable condition. The one-horse Hose Reel needs to be painted.

APPROPRIATIONS AND EXPENDITURES.

Total appropriation balance March 1, 1893	$23,630 01
Apparatus, Hose Cart, etc., Nos. 1 and 2	2,000 00
Total	$25,630 01

RECAPITULATION OF EXPENDITURES.

Paid services rendered on organizations	180 00
Pay rolls	8,286 65
Apparatus (new)	798 26
Apparatus (repairs)	228 35
House (repairs)	551 58
Horses	1,530 00
Horse feed	575 62
Horse shoeing	111 25
Harness and repairs	258 30
Fuel	27 00
Rent	552 50
Telephone service	274 40
Stores and supplies	608 61
Aid to Company No. 5	250 00
Improvements Fire Police Hall	374 77

Rent Fire Police Hall (7 months)	245 00
Bedsteads and furniture	283 50
Hydrant posts, etc	82 00
Rules and printing	54 75
Service badges	125 25
Purchase No. 2 flag pole	50 00
Hack hire	6 00
Volunteer Fire Department (Sundry bills)	386 25
	$15,840 04

Balance of appropriation, September 1, 1893 . . . . $ 9,789 97

DISPOSITION OF OLD APPARATUS.

The old Clapp and Jones Engine, formerly the Engine of Company No. 1, also, the old four-wheeled Pacific Hose Co's Reel were, upon the request of the Minister of the Interior, with the approval of the Board of Fire Commissioners, forwarded by me to the Hilo Fire Department.

PAID OFFICERS AND MEMBERS OF THE HONOLULU FIRE DEPARTMENT.

Frank Hustace	Chief Engineer.
Jas. H. Hunt	Senior Foreman.
Wm. Keawe	Foreman No. 1.
Geo. Townsend	Foreman Hose Co.
Gus. Morrissey	Driver No. 1.
W. O. Barnhart	Engineer No. 1.
Kamile	Stoker No. 1.
C. Smith	Messenger No. 1.
W. H. Bromley	Engineer No. 2.
Tom Morrissey	Driver No. 2.
J. L. McDonald	Hoseman No. 2.
T. K. Clarke	Hoseman No. 2.
Tom Price	Hoseman No. 2.

One double Tank, 80 gallons each; Chemical Engine, complete, with Ladders and Tools, in first class condition.

One large Hook & Ladder Truck, Ladders, etc., complete, in good order.

One new Boiler at the Government Warehouse.

One N. P. Jacket.

Four spare coils of Copper.

Two sets of Grates.

All for second-class Clapp & Jones's.

STORES.

Rubber Hose, Maltese X, feet, 1000.

One pair Hind Wheels for No. 2 Engine at Wright & Son's shop.

Complete set of Tools, for all necessary work.

Lot of small stores, Coal, Wood, etc.

One case Axes.

Three pieces of Suction Hose, 10 feet long (4 inches).

Two pieces 7 feet each Suction Hose $2\frac{1}{2}$ inches.

VIOLATIONS OF LAW.

May 1. In fire limits, new shed erected by Ahi on Nuuanu street, (uprights of wood).

May 3. On Holt's property, Nuuanu street, new room built of wood, also, reshingled the whole of back of building.

May 4. On Alakea street, on property of Union Iron Works, two small wooden buildings erected. Since then no violations have occurred to my knowledge.

DISASTROUS FIRES.

The city has been quite fortunate in not having any large conflagrations during my term of office.

The only disastrous fire during said term being the residence of J. M. Vivas, on the Plains, which took place on the morning of March 25th, at 1.30 A. M. The fire was well underway when the Fire Department was notified. Engine Company No. 1 responded to this alarm, and had a stream on the building in fifteen minutes after the alarm was turned in. This saved the adjoining house owned by Mr. Levi Marks.

RECOMMENDATIONS.

I hereby recommend that one of the Steam Fire Engines be placed on the Plains with a team of horses, which can be so regulated that if their services are needed in town, in case of a large fire, they can be at work in the town inside of fifteen mimutes after the alarm is sounded.

I futher recommend that the Chemical Engine be placed in commission for the better protection of property in this city in place of China Engine Co., which I claim is of no benefit to the Department.

The same could be placed in commission for a very small cost, which would be for a team of light horses, also, by placing only one more driver on the pay roll, say at $50 per month, and that could be saved by a three months notice to China Engine Co. This engine, if placed in the house of No. 2 Engine, will be able to extinguish nine fires out of ten, which would mean less damage by water to stock than is the case now. The damage to goods is always more by water than by fire in nine cases out of ten.

I would call your attention in regard to Chemical Engines to the last report of Chief Scannell of San Francisco Fire Department, he says:

"The efficiency of Chemical Engine Cos. for extinguishing fires in their incipiency is clearly illustrated by the record of Chemical Engine No. 1, she having extinguished unassisted

67 per cent. of the fires in her district during the last fiscal year."

In closing my report I desire to tender my thanks to the Honorable Board of Fire Commissioners, the officers and members of the Department for their support, which has been the cause of the success and efficiency of this Department.

Hoping (as I have resigned this position) that you will give my successor the same support that you have given me, and that the efficiency of this Department will always be maintained.

Respectfully submitted,

FRANK HUSTACE,

Chief Engineer Honolulu Fire Department.

HONOLULU, August 31, 1893.

REPORT OF CHIEF ENGINEER JAS. H. HUNT.

OFFICE OF CHIEF ENGINEER, H. F. D.

MR. ANDREW BROWN,

Chairman Board of Fire Commissioners.

DEAR SIR:—In accordance with section 2, Act 17 of the Provisional Government, I now present you with the second semi-annual report from September 1, 1893, to March 31, 1894.

During my term of office in addition to other needed improvements, two adjustable Hale collars have been purchased for the Department, also, one 8 inch electro mec. fire alarm gong, and one Thompson fire lighter for team No. 1 Engine. In regard to hydrants I would respectfully submit the following: As there are a number of standing hydrants now on hand that are not placed, I would respectfully suggest to your Honorable Board that they be put in service; that there are a number of ground hydrants now in use that could be replaced by standing hydrants with great advantage to the Department.

FIRE ALARMS.

During the six months there has been a total of five alarms, as follows:

Children playing with matches	1
Lamp upset	2
Unknown	1
Lime	1

FIRES ACCORDING TO WARDS.

Ward.	*Fires.*	*Ward.*	*Fires.*
1	0	8	0
2	0	9	0
3	2	10	0
4	1	11	1
5	0	12	1
6	0	13	0
7	0		

COMPANY DRILLS.

Drills have been held regularly three or four times a week, which has been the means of making the men very efficient in making connections.

LOSSES BY FIRE, INSURANCE PAID.

Total loss in five fires	$ 258 00
Total loss paid	258 00
Total amount of insurance	2,000 00

CONDITION OF APPARATUS.

The engines and other apparatus of the Department are in a first-class serviceable condition.

BUILDINGS.

Engine Co. 1 building seems to be in a good condition. Engine Co. No. 5 in the same good condition. Engine Co. No. 2 and Hose Company buildings, also the Bell Tower, are old, in a leaky condition, and should be replaced by new ones. The property on which they are situated not being Government property, should be purchased by the Government, as it is the best site in town for headquarters, being so centrally located.

APPROPRIATIONS AND EXPENDITURES.

Balance of appropriations September 1, 1893	$ 9,789 97
February 8, 1894, new appropriation	2,600 00
Total	$12,389 97

RECAPITULATION OF EXPENDITURES.

Pay rolls	$ 8,776 55
Apparatus (repairs)	64 25
Houses (repairs)	13 83
Horse feed	750 83
Horse shoeing	121 25
Harness and repairs	112 50
Fuel	25 00
Rent of houses	630 00
Telephone service	210 00
Stores and supplies	490 01
Aid to Company No. 5	350 00
Rent Fire Police Hall	245 00
Hack hire	4 00
Use of Horse	20 00
	$11,813 22
March 31, 1894, balance of appropriations	$ 576 75

PAID OFFICERS AND MEMBERS OF THE HONOLULU FIRE DEPARTMENT.

Jas. H. Hunt	Chief Engineer.
F. H. Cooper	Senior Foreman.
Mark Kennedy	Foreman No, 1.
W. O. Barnhart	Engineer No. 1.
Kamaile	Stoker No. 1.
Gus Morrissey	Driver No. 1.

C. Barnes.....Messenger No. 1.
W. H. Bromley .....Engineer No. 2.
Tom Morrissey.....Driver No. 2.
F. May.....Stoker No. 2.
J. J. Carlessen.....Hoseman.
T. King .....Foreman Hose Co.
Jos. Clark .....Hoseman.
S. Johnson.....Hoseman.
D. Brown.....Hoseman.
S. Sandford.....Hoseman.
Chas. Lambert .....Hoseman.
G. Nelson.....Hoseman.
G. W. Hellicksen.....Hoseman.
Naone.....Messenger No. 2.
G. Manson.....Secretary.

IN REGARD TO FIRES.

The city has been quite fortunate in not having any large conflagrations during the past six months.

DUTIES OF THE CHIEF ENGINEER.

In regard to the storage of kerosene oil according to Chapter LXVIII, Session laws of 1890, the duty of inspecting stores and premises where oil is stored should be under the supervision of the Chief Engineer; as it is at present no one has the power to remove any lots of oil over the amount allowed by law.

Also, power should be given him in cases where persons have a lot of straw or other inflammable material stored within the city limits, whereby the property of others may be endangered, to have the same removed at their expense, if not removed in a given time.

RECOMMENDATIONS.

I hereby recommend that one of the steam Fire Engines be placed on the Plains with a team of horses, which can be so regulated that if their services are needed in town in case of a large fire, they can be at work inside of fifteen minutes after the alarm is sounded.

I would respectfully recommend that your Honorable Body give this matter your closest attention, as that section is becoming more thickly populated, and they require an engine stationed there more at this time than ever before. I have placed the Chemical Engine in commission for the better protection of property in this city, leaving me two spare engines to place. In the event of your approval of my suggestion of placing one on the Plains, I would still have an extra one remaining for city use, always ready at a minute's notice.

ESTIMATED ACTUAL REQUIREMENTS.

Rents, Bell Tower premises	$ 2,160 00
Telephone service	792 00
New hose	1,500 00
Horse feed	3,120 00
Repairs for apparatus	1,500 00
Coal oil	340 00
Waste, oil, tools, etc	300 00
Harness and repairs	600 00
New apparatus	1,000 00
Coal and firewood	200 00
Sundry incidentals	500 00
Extra labor	1,800 00
	$13,812 00

In closing my report I desire to tender my thanks to the Honorable Board of Fire Commissioners, and to the officers and members of the Department for their support, which has tended greatly to the success and efficiency of the Department.

Respectfully submitted,

JAS. H. HUNT,

Chief Engineer Honolulu Fire Department.

HONOLULU, March 31, 1894.

Concluding the above report, the Board of Fire Commissioners would respectfully inform Your Excellency that they are in hearty sympathy with the recommendations contained in the report of Chief Engineer Jas. H. Hunt, and trust that the same will meet with the approval of Your Excellency, and be carried out at an early date.

ANDREW BROWN,
GEO. W. SMITH,
HUGH GUNN.

REPORT

OF THE

CHIEF ENGINEER HILO FIRE DEPARTMENT.

HILO, HAWAII, March 31st, 1894.

HIS EXCELLENCY J. A. KING,

Minister of the Interior.

DEAR SIR:—I have the honor to submit herewith my report as Chief Engineer of the "Hilo Fire Department," from the date of organization to March 31st, 1894.

ORGANIZATION.

In accordance with "An Act to provide a Fire Department for Hilo," Session Laws of 1892, Hilo Engine Co. No. 1 was organized February —, 1893, and acted as the Provisional Department until July, 1893, when the first regular election was held, resulting as follows:

Dan'l Porter, Chief Engineer;
Allen Wall, Assistant Engineer.

Mr. D. Porter resigned after holding the position about one month, and I was elected Aug. 3rd, 1893, and the first regular meeting of the Board of Representatives of the Fire Department was held on Sept. 15th, 1893, when the by-laws of the Honolulu Fire Department were adopted with a few alterations.

MEMBERSHIP.

The number of active members of the Department has been steadily increasing with the popularity of the movement and is now thirty-two, all belonging to Engine Co. No. 1, and officered as follows:

Chas. H. W. Hitchcock, Foreman;
Thos. Mutch, Assistant Foreman;
Otto Rose, Captain of Hose;
A. W. Richardson, Secretary and Treasurer;
J. R. Wilson, Delegate;
Geo. Silva, Steward and Watchman, under a salary at $10 a month.

Mr. J. R. Wilson also acts as engineer without pay.

INVENTORY OF APPARATUS.

Engine No. 1, complete, second hand.
Hose cart " "
Coal cart " "
400 ft of 3-in. hose, 300 ft. new, 100 ft. old.
50 ft. of 1-in. hose.
6 Hydrants, etc.

A temporary shed was built at an expense of $148.13 to cover the above apparatus until a permanent and suitable structure could be provided, and is not fitted up with a hose tower or any of the conveniences for taking care of the property.

A lot has been secured in a convenient part of town, and I would urge the appropriation of a sufficient sum of money for a permanent building, to be provided with a hall where the companies and department can meet to transact business.

ESTIMATE OF REQUIREMENTS.

Building for Engine Co. No. 1..... $2,500 00

Running expenses for two years	1,000 00
Cost of hydrants, repairs, etc.	200 00
Total for next biennial period	$3,700 00

As a portion of the expenditures of this Department for the period just closed were made before it was fully organized. I have not the data at hand to make a full report thereon.

I have the honor to be,

Your Excellency's most obedient servant,

WM. VANNATTA,

Chief Engineer Hilo Fire Department.

REPORT

OF THE

REGISTRAR OF CONVEYANCES.

HONOLULU, H. I., March 31st, 1894.

HIS EX. J. A. KING,

Minister of the Interior.

SIR:—The biennial period just closed has been so uniform in the several lines of duty devolving upon this Bureau as to leave little to present in the way of a report apart from the record of its routine.

While the amount of renumerative business done falls considerably behind that of the preceding period, owing to the prevailing business depression, it is to be noted that it about reaches the $16,000 estimated revenue for the term.

RECEIPTS OF THE BUREAU.

The following table shows the total revenue of the office by the classified division of its work:

Amount received	from	recording fees		$14,210 50
"	"	"	search fees.....	115 00
"	"	"	certif'd copies miscel. insts.	676 50
"	"	"	acknowledgments	278 00
"	"	"	copies R. P. and L. C. A..	704 00
Total			.....	$15,984 00

At the close of March there remains as due the Bureau for papers completed, or in hand, the further sum of $54.50 which amount carries over into the new period.

RECORDED WORK, ETC.

The total number of recorded and copied instruments for the last period has been 5,069, as against 6,100 for the one previous. Classified the work bears out, proportionately, much the same as shown in previous reports. The following table comparative, may be of interest in this respect:

CLASSIFIED COMPARATIVE TABLE FOR BIENNIAL PERIODS 1888-90, 1890-92 AND 1892-94.

CLASS.	1888-90	1890-92	1892-94
Conveyances, real estate	1,936	2,157	1,879
Trust deeds	22	17	24
Leases and extensions	841	869	681
Assignment and surrender of leases	90	49	50
Mortgage deeds	688	990	747
Chattel mortgages	165	131	94
Assignment of mortgages	163	152	130
Release of mortgages	525	633	507
Affidavits	116	76	86
Bills of sale	224	320	207
Powers of Attorney	126	99	108
Agreements	123	77	62
Deeds of adoption	9	36	20
Deeds of copartnership	16	25	11
Miscellaneous instruments	46	39	71
Certified copies from miscel. records	242	211	191
Copies R. P. and L. C. A.	156	219	201
Total	5,488	6,100	5,069

GRATUITOUS LABOR.

The preparation of quarterly abstract sheets of recorded realty transactions, etc., and forwarding same to the Assessors-in-chief of the several taxation districts has been continued in conformity to law, which, as mentioned in former reports, is one of the unremunerative duties. Some attempt has been made to require search of records, copies of instruments, royal patents and awards as additional gratuitous service, but I fail to find any warrant in law for such new imposed duty.

RE-INDEXING DELAYS.

The work of re-indexing the back records has not progressed as continuously as desired, nor as the public demands. This has resulted through the shortening of the office force by doing away with the deputy's services in May last, followed in September by further dispensing with one of the copyists through the circular letter of the Minister of Finance enjoining "a reduction of the clerical force, if possible, to curtail monthly expenses." This has necessitated such interruptions in the indexing work, in order to keep the current work well in hand, that we find ourselves still in the third series, embracing the years 1878 to 1884. It is hoped, however, that a few weeks further work will complete the entries when they will receive their final comparing and be ready for service.

The recent death of the second oldest clerk of the office, whose efficient services in whatever duties were assigned him was marked, is a loss that will be felt for some time to come; especially in the delayed indexing work.

On the completion of the third series, above mentioned, there will be but one more required to complete the system and connect with the current series which began with 1889.

I but express the views of all who have occasion to search the records in hoping the necessary help will be given to hasten its completion.

TABLES OMITTED.

The statistical tables of former reports are dispensed with, partly for want of time, and partly the fact that so little use was made of them as to suggest the idea that their preparation and printing is a needless expense.

STAMP DUTY EXPERIENCES.

While the vexed questions relative to stamp duties have not been so numerous as in former periods, there have been nevertheless frequent occasions where expressions more forceful than elegant have been used at the rates demanded by the revised Act of last Session. Several instances have occurred in consequence where parties declined to have their instruments stamped and recorded, and the threat is not infrequent of having instruments made out for nominal considerations.

More stamp duty friction falls to the experience of this office than heretofore from the fact that since the transfer of the executive offices to their new quarters, I have arranged to carry a supply of revenue stamps as a public convenience. While many express due appreciation of the step others voice a far different sentiment.

DEFECTIVE INSTRUMENTS.

Reference was made in my report of 1890 of difficulties in search work, etc., through many instruments failing to show derivative title. This source of much confusion and consequent expense, is by no means an evidence of primitive work of the early days, nor by ignorant natives who have drawn their own deeds to save expense, but is more the result of

careless or questionable work. Since the opening of the year six such deeds have been filed for record that showed neither derivative title nor location of property. Abstracts of such instruments are a delusion to the assessors, and a puzzle to the indexer as to where such may belong, or what proportion belongs to the first, second, third or fourth division.

On two occasions I sought to have a description, or location of the property set forth but obtained, in reply, the known fact, being duly stamped and acknowledged the office had nothing to do with their shortcomings. While this in a sense is true, a literal observance of the law might well be deemed questionable duty, when by the exercise of due discretion, the rule might be departed from, to the advantage of all parties concerned.

A case in point transpires at this writing in which clear duty directs the return of the instrument for correction rather than place it on record, though the requirements of law, so far as this office is concerned, has been complied with.

It might be deemed a hardship to require, by law, that all deeds, etc., be drawn by duly qualified, licensed, conveyancers, as is said to obtain in some other countries, but it would save much confusion and after litigation if all instruments conformed to certain legal requirements.

COPYING FROM THE RECORDS.

The liberal rule adopted by the Cabinet several months ago for this office, relative to copying from the records, has modified somewhat its income from that source, and is likely to prove more reductive as it becomes generally known.

PROSPECTIVE.

Judging by past experience I place the estimated revenue

for the coming period again at $16,000, and the expenditures for salaries and incidentals at $13,370.

From the many enquires for real estate and the new interest that will be given land matters in the contemplated changes in the Crown Land department, it is but natural, however, to look forward to material additional work for this Bureau in the months to come.

ESTIMATE OF INCIDENTAL REQUIREMENTS FOR REGISTRY OFFICE, 1894-96.

One sets indexes—continuance current work, 8 books	$100 00
One " to complete back work, 6 books	75 00
Ten vols. record books	80 00
Re-covering indexes and repairs on records	40 00
Stamps and postals for period	40 00
Printing and numbering blanks, etc	25 00
Stationery	90 00
	$450 00

Respectfully submitted,

THOS. G. THRUM,

Registrar of Conveyances.

REPORT

OF THE

COMMISSIONER OF AGRICULTURE.

His Ex. J. A. King,

Minister of the Interior and

President of the Bureau of Agriculture and Forestry.

Sir:—I have the honor of presenting the report of the operations of the Bureau of Agriculture and Forestry for the biennial period ending March 31, 1894.

This Bureau was organized and the first meeting held on March 29, 1893. It has therefore been in existence one year, or one-half of the biennial period.

One of the first matters the Bureau had to deal with was the prevalence of many blights and insect pests, which were affecting the vegetation of Honolulu and its suburbs; and the Bureau after careful consideration instructed your Commissioner to purchase and erect the necessary apparatus for the compounding of the most approved insecticides, and to manufacture and furnish the same to all persons supplying the necessary crude materials. Many thousands of gallons of insecticides have been supplied to the public in this manner, which have proved more or less effectual in destroying blight, according to whether the spraying was well or poorly done.

Your Commissioner was also instructed to procure a number of spraying outfits, and loan the same without cost to the public. This has been done and a number of outfits are in constant use, and are undoubtedly of great benefit in keeping

many valuable trees alive, which would otherwise succumb to the ravages of the various blights which have obtained such a foothold in Honolulu.

It was soon ascertained that some of the blights and destructive insects known in Honolulu had not reached any of the other islands, and in order to prevent as far as possible their doing so, the Bureau passed a regulation forbidding the carrying of trees or plants to any of the other islands. Up to the present time this has proved effectual, as none of the new destructive blights and insects have yet been found on the other islands, although several blights that have been known for years are found all over the group.

The attention of the Bureau was soon drawn to the fact that any method of spraying or fumigating, etc., were only checks to the ravages of the blights and insects, and were entirely ineffectual in eradicating the pests, and that the only means of ridding the country of them was by introducing the natural enemies of the same. The attention of the Bureau was directed to the great results accomplished in California by this method. The Bureau at once, through its secretary, entered into a correspondence with Professor A. Koebele, who was known to have had great and successful experience in applied entomology, with the result that an engagement has been entered into with Professor Koebele for him to devote his time for a period of three years, to the searching for and the introduction of the natural enemies of the many blights and insect pests that are prevalent in this country.

The Planters' Labor & Supply Co. have generously agreed to bear one-half the cost of Professor Koebele's salary and expenses during his engagement. Professor Koebele has made a tour of the principal agricultural districts on the different islands, and his report is appended herewith.

MAKIKI FOREST.

The work of planting this forest has been continued during the past eleven months under the immediate charge of Mr. David Haughs, a trained forester, who has, with a force of five Japanese, propagated and planted on the slopes and ridges of Makiki valley the following numbers and varieties of trees:

Eucalyptus (various)	10,000
Acacia albizzia	2,500
" melonoxylon	3,500
Mexican Ash	2,500
Grevillia robusta (silk oak)	7,500
Acacia decurrens (black wattle)	30
" mollissima floribunda	30
White mulberry	130

There have also been planted in the valley below the laborers' quarters, the following fruit trees imported from Australia:

Oranges, 109	15	varieties
Citrons, 6	5	"
Lemons, 16	3	"
Persimmons, 10	4	"
Almonds, 6	3	"
Guavas, 10	2	"
Figs, 9	3	"

To make room for these trees, considerable thinning out of the eucalpytus had to be done (which has been planted in this valley); there were also in this valley large clumps of mangoes and avocado pear trees, which were planted so closely together as to form a dense thicket, and would never (while left in that condition) bear fruit. One hundred and seventy-

five of these trees have been successfully transplanted to favorable locations, leaving plenty of room for those remaining, some of which will bear fruit this year.

A nursery has been established of about one acre in extent, the ground has been carefully prepared in a thorough manner by digging and trenching, and there are now 21,000 young trees in this nursery, among which are 1,300 Kona orange seedlings, 950 seedlings of other kinds of oranges ,1,500 persimmon seedlings, 3,000 camphor trees, and 2,000 Japanese chestnuts. There are also in addition to the above sixteen varieties of imported oranges, four of lemon, three of citrons, three of almonds, five of persimmons and four of figs. These trees will be used for the purpose of obtaining scions and buds with which to bud and graft the seedlings now growing in the nursery, which will when ready, be planted out in suitable locations.

In addition to the above there are over 8,000 young trees in boxes and leaf pots ready for planting out. They are as follows:

Logwood	1,600
Acacia albizzia	4,000
Kona coffee	800
Camphor	200
Schinus molle	200
Date palms	100
Calophyllum	80
C. inophyllum	40
Jack fruit	3
Mangoes	180
Paulownia imp	290
Grevillia rob	1,500
E. citrodora	200

Logwood	110
Ailanthus	200
Various kinds	300

KING STREET NURSERY.

Since last May this nursery has been under the immediate supervision of Mr. H. G. Rhodes, who was engaged as gardener to replace Mr. Carl Willing. Since that time, or during eleven months there have been distributed free to the public 9,790 trees and plants, and to public schools 300. The varieties distributed have been as follows:

Fruits	19
Timber	13
Shade and ornamental	13
Economic	4
Shrubs and vines	9
Palms	17

There are now on hand the following numbers and varieties of trees and plants: 20,000 fruits, 16 varieties; 12,950 timber, ornamental and medicinal; palms, 11,750; and fiber plants, 6,513.

The method of preparing the young plants and trees for distribution has been to transplant the young trees from the boxes and beds (where they have been propagated) into leaf pots made by the Japanese laborers from leaves of the lauhala or pandanus palm. When established in these pots they are ready for distribution, and only require to be planted, pot and all, in the ground prepared for their reception, where the pot soon decays, affording nutriment to the growing plant.

DISTRIBUTION OF SEEDS.

Owing to the very necessary regulation prohibiting any plant being carried from the Island of Oahu to any of the

other islands of the group, none of the people on the other islands have received any benefit from the distribution of plants from the Government nursery. The Bureau therefore instructed your Commissioner to supply seeds to all persons applying for the same. The following varieties of seeds have been distributed throughout the group: E. globulus, E. robustus, Mexican ash, iron wood, logwood, grevillia robusta, acacia mollissima, A. decurrens, A. alophantha, A. melonoxylon, Ailanthus glandulosus, paulownia imperialis, pittosporum eugenoides, salisburia adiantifolia, ponciana regia, Sumatra, Havana, Virginia and Turkish tobacco seeds, nutmeg (myristica fragrans), camphor, coffee, fruit and fifteen varieties of palm seeds.

The Bureau has also imported from India a quantity of san seed (crotalaria juncea), a valuable forage plant, and especially valuable as a green crop fertilizer for tobacco and sugar lands. Every plantation on the group has received from the Bureau five lbs, of this seed for a trial planting. If this plant grows well in this country, it will be a valuable aid to the sugar industry. Many other persons have also taken these seeds for the purpose of growing feed for cattle.

The following valuable seeds have been received from the Government Botanist at Melbourne in exchange for those sent by the Bureau:

A triplex halimoides of the very best for salt bush pasture.

A triplex mummilarium, one of the tallest and most fattening and wholesome of Australian pastoral salt bushes. Sheep and cattle pastured on this plant are said not only to remain free from fluke, but to recover from this distoma disease and other allied ailments.

A triplex spongiosum and A. prostratum, valuable like the preceding for saltbush culture. A vesicarium, one of the

most relished and most fattening of all the dwarf pastoral saltbushes of Australia, holding out in the utmost extremes of drought and not scorched even by sirocco-like blasts.

The Bureau has also received in exchange from the Curator of the Museum at Auckland, seeds of phormium tenax or New Zealand hemp, which has been planted at the Government nursery.

In exchange from Samoa, seeds have come to hand of some of the most beautiful scent bearing trees growing in that country, also, seeds of a superior variety of mangoes. These are being propagated at the nursery, and will be a valuable addition to the flora of Hawaii.

Among the various seeds imported by the Bureau during the past twelve months may be mentioned the following new species as suited for industrial and timber culture: Cryptomeria japonica, the sugi or Japanese cedar, producing a long, straight and much esteemed timber, extensively cultivated in the Azores for this purpose. Two varieties of camphor seeds, producing both timber and the well-known camphor gum. Japanese giant chestnut producing large sweet nuts; suitable for our higher lands.

Diospyros kaki, Japanese persimmon, five varieties, fruit much esteemed, yielding a valuable hard timber, suited like the preceding to our higher elevations. Teak wood (tectona grandis), a superb timber tree, should do well on our denuded forest lands. Price of the timber in London $75 for fifteen cubic feet.

Ceara rubber (manihot glaziovii), one of the best of the rubber producing trees, suited like the preceding to our open forest lands.

Palmyra palm (Borassus flabelliformis), probably the most useful of all the palms, as this palm in India extends to 30° north. It should flourish in this country.

Elettaria cardamomum, producing the well-known cardamon spice, the highest priced of all the spices, $1.75 to $2.25 per lb. in the London market, will grow at from 400 to 2,500 feet elevation.

Myristica fragrans (nutmegs), suited for culture in the Hilo, Puna and Kona districts.

Theobroma cacoa, a few seeds of the best varieties of this valuable economic tree have survived the journey from Ceylon, and have germinated at the Government nursery. The cultivation of cacoa may prove a remunerative employment in moist and humid districts, such as Hilo, Kona and Puna.

FIBER PLANTS.

The Bureau has drawn the attention of the public to the great possibilities of successful cultivation of several fiber producing plants, the more important being the agave sisalana or sisal hemp plant and the sansevieria or bow string hemp. A number of persons are now planting all they can get of the sansevieria, and at the Government nursery all the available land has been set out with this plant, so that in the course of the next twelve months many thousands of young plants will be available for industrial culture. The cultivation of this plant is particularly adapted to small cultivators. Five acres of sansevieria planted on good moist land would yield a good livelihood for a small family. It yields its first crop within two years from first planting, and a crop every year after for ten years without replanting. The cultivation of this plant with coffee would certainly solve the problem of how to make small farming profitable on these islands, and every encouragement should be given to its cultivation by amending the law of 1892, "To encourage the cultivation of Coffee and Ramie," by striking out the word ramie and ininserting the words "fiber plants."

The plant of greatest promise, and one which offers the greatest inducements for the employment of capital, is the Agave sisalana. In this plant we have the means of utilizing the hundreds of thousands of acres of barren land, now worth little or nothing, and establishing an industry that will provide homes and give employment to thousands.

Your Commissioner has offered his services to the public in procuring a supply of these valuable plants, and nearly thirty corporations, firms and individuals have given orders for 61,000 plants. These have been ordered from Florida, the only country from whence they can be procured, other countries imposing both fine and imprisonment on any one taking any of the plants out of the country. There are strong indications that some such law will be enacted in regard to Florida, and no time should be lost in procuring as large a supply of sisal plants as possible. In order to encourage as much as possible the cultivation of this and other fiber plants, I would recommend that this Bureau procure a good fiber machine and an engine to drive it, and exhibit to the public the practical work of cleaning and preparing fibers for market. Object lessons of this character will go far to encourage many to turn to the cultivation of fiber plants, who would not be reached by anything that might be written and published on the subject.

TOBACCO.

Little has been done in the cultivation of this important article of commerce. It has been demonstrated, however, that the Sumatra variety grows well, but not enough has been raised to create a bulk for fermentation; this could not properly be done on a less quantity than could be raised from twenty-five acres of land. Fermentation is required in order to bring out the true color and flavor of the tobacco.

A patch of the Sumatra tobacco has been grown at the Government nursery, part of it was let run to seed, of which there is a large quantity on hand, and the rest was cut and cured in the best manner. Although not fermented this tobacco has a good appearance, which could be greatly improved by fermentation. Samples have been sent abroad, and replies as to its value are being awaited with much interest.

COFFEE.

The cultivation of coffee on improved methods can now be said to be fairly started. The Hawaiian Tea & Coffee Co. in Kona, Mr. R. Rycroft in Puna, and the settlers in Olaa, are examples of what intelligent cultivation can do in the production of this important staple. When it is remembered that almost all the coffee hitherto produced on these islands was prepared for market by the most primitive methods, and still compares favorably with the best brands, there is every reason to believe that Hawaiian coffee will rank with the best in the world.

The difficulties in the way of the successful prosecution of coffee cultivation may be said to be the coffee blight and the insufficiency of labor. In regard to the first it may be safely predicted that in twelve to eighteen months the coffee blight will be a thing of the past, insects have already been sent here from California that will be as effective on this blight as was the vedalia cardinalis on the cottony cushion scale.

The labor problem is one that will have to be seriously considered. As coffee culture increases the need of a greater supply of labor will be strongly felt, particularly at picking time; a large force is then needed for three or four months, after which, if coffee alone is cultivated, there is need only of a small part of the force required for picking. It will there-

fore be neccessary for the coffee grower to have some other cultivation in order to employ the extra labor, when not engaged in picking coffee, so that he may always have the necessary force at hand to save the crop. This subject has already been treated on by your Commissioner in articles in the daily papers, and many of the coffee growers are now giving attention to other economic products, as an adjunct to their coffee enterprise. The Hawaiian Tea & Coffee Co. have ordered through this Bureau 4,000 sisal plants, with a view to their cultivation in conjunction with their coffee and tea enterprise. Others are paying attention to the merits of the bow string hemp (sansevieria zelanica), and it will be the aim of your Commissioner to introduce and bring the attention of the public to such economic products as may offer a reasonable prospect of profitable cultivation in this country.

Several coffee growers have procured through this Bureau some thousands of Liberian coffee seeds, which coffee is said to be resistant to blight. A quantity of these seeds have been planted at the Government nursery, and when ready will be distributed to the public.

NEW NURSERY AND BOTANIC GARDENS.

At a meeting of the Bureau held on July 5, 1893, the question of procuring a more suitable and larger tract of land for an experimental and botanic garden was considered. Your Commissioner was instructed to apply to His Excellency the Minister of the Interior to set apart the land of Kewalo, situated on the southeast slope and mauka of Punchbowl, for an experimental and botanic garden under the auspices of the Bureau. This land has been set apart by the Minister of the Interior according to Section 7 of the law to establish a Bureau of Agriculture and Forestry, passed in 1892.

This land is admirably situated, comprising both hill and

valley, with a remarkably rich soil on the lower lying portions. All the economic trees and plants can be grown and experimented with on this land, but in order to carry on this work, water is needed on the land. The Government water mains are now within a short distance, and not more than half a mile of 4-inch pipe is required to be laid to carry the water so as to command all the lower and richer portions of the track. Attached hereto is an estimate of the cost of main and branch pipes, and connections to carry the water all over the land.

The Reformatory School could be moved to this site, and the boys, under the superintendence of a competent gardener, would be able to do nearly all the work of the garden, acquiring habits of steady industry and becoming familiar with the processes of the propagation and care of plants, grafting, budding, tree planting, etc., leaving them in a condition, when released from school, to earn their own living and become useful members of society.

The work of carrying on the forest planting can, with equal advantage, be carried on from this site. Most of the land yet to be planted can be more easily reached from the new ground than from the present station below Tantalus, as all the land for quite a distance around the camp has been planted, and the distance for the laborers to travel to their work is continually increasing.

DANGER FROM FIRE.

During the month of September, 1893, two fires occurred within a few days of each other, they both took place in Pauoa valley. The first one was started on the north side on private lands, apparently for the purpose of burning off the old grass so as to provide new pasture. No attempt was made by the owners to confine the fire to the lands upon

which it started, and was only subdued and extinguished by labor hired and paid by the Government.

The second fire was started on the south side of the valley by some one, supposed to be a Chinese, burning up some rubbish. This fire which raged fiercely for several hours was only prevented from entering and destroying the new forest by great exertions on the part of Mr. D. Haughs, the forester, with the Japanese laborers and some natives and Portuguese who were luckily within easy call, while the fire in the valley was only brought under control and subdued by the help of a gang of men working from the valley.

Rewards were offered for information that would lead to the apprehension and conviction of the parties who started the fire, but no evidence could be obtained. In order to prevent as much as possible danger from future fires, strips of land surrounding the forest will be cleared of grass and weeds as the dry weather sets in. In this connection it would seem reasonable that owners of land upon which any fire should originate, should be obliged to keep such fire within bounds upon their own lands, or else be held responsible for any damage that may ensue from such fire.

During the month of January a gang of prisoners were employed in the work of planting the sides of Punchbowl with keawe seeds (prosopis dulcis); these seeds were planted six feet apart, and many of them have grown. It is the intention of your Commissioner to supplement this preliminary planting, by setting out next year young growing trees of the prosopis dulcis in any of the places that have missed. Seeds have been propagated at the nursery for this purpose, and they will be cared for until the next rainy season. The greater part of Punchbowl is under lease to the Queen Dowager, who has given her consent to the Government planting the land, and an agreement will be prepared for her to sign to the

effect that she will not permit any destruction to the trees that may be planted.

In a few years Punchbowl will be a green hill, refreshing to the eye, instead of the dry barren appearance which it now presents.

THE EXPERIMENTAL CULTIVATION OF OYSTERS.

Several experiments have been made during the last few years in the cultivation of oysters in our waters, but they have failed, owing largely, so far as I can ascertain, to ignorance of the best methods of transplanting them.

Recently, Mr. W. N. Armstrong, who is largely interested in the cultivation of oysters in the Chesapeake Bay, in the State of Virginia, has examined the waters of Pearl harbor for the purpose of determining the suitability of that location for oyster culture. He reports that apparently all the conditions for successful culture exist, both as regards the food of the oyster, the climate and the protection against storms. There may be, he thinks, enemies of the oysters at present unknown here, but that proper precautions may be taken against them if they should appear. The existence of large mounds of shells near Pearl harbor, show that large and apparently fine oysters existed there in former times, but which were destroyed by some volcanic upheaval, or flood of fresh or hot water, and this species of oysters was killed. It has been only after repeated trials and experiments that the Atlantic oyster has been transplanted so that it will reproduce itself in the waters of San Francisco bay. There appears to be no reason why oysters, in a sound condition, should not be brought to these islands from the Pacific Coast and be made to thrive here, if care is taken in the selection and transportation. I would recommend the successive imports of a few barrels at a time for such experimental purposes. I am as-

sured that I can have the co-operation of the officers of the United States Fish Commission in California, in securing suitable kinds for trial.

CONSERVATION OF FORESTS.

The attention of the Bureau, since its organization, has been strongly directed to the rapid deforestation that has taken place, and is still going on, in the important sugar growing districts of Hamakua and Kohala, on the Island of Hawaii, and in the equally important districts of Hamakuapoko and Kula, on the Island of Maui.

With the object of devising ways and means to arrest the destruction of the Hamakua forests and to reforest the same, your Commissioner visited Hamakua and called a meeting of the planters and others interested. The result was that all the planters in the district signed a letter in which they agreed to bear all the expense of building a fence through the district of Hamakua, which would preserve from further destruction a tract of country over three miles wide, by twenty miles in length, provided arrangements were made to devote the land within the line of the proposed fence to the exclusive purpose of maintaining a permanent forest. Later on the planters further agreed to undertake the work of planting a forest on the denuded portions of land within the proposed line. Up to the present time no arrangement has been made between the planters and the representatives of the Parker estate, who control nearly all the land (either by lease from the government or by fee simple) on which it is desired to preserve the forest. The objection by the Parker estate to the proposed fence is, that the fence would cut their cattle off from the only available water supply in dry times. This water supply consists of numerous water holes in the gulches in the lower remaining forest; formerly these water holes extended for

miles back, but as the cattle destroyed the forest, the water holes deprived of the protecting shade of the trees have dried up, and it is but a question of three or four years at most, when the remaining forest will be destroyed, and the present water supply for the cattle disappear; this fact is admitted by the Manager of the Parker Ranch.

A suggestion has been made by the planters that the Parker estate fence the gulches containing the water holes, so as to allow the cattle free access to the water, while preserving the forest from destruction, the planters carrying out their agreement to do all the other fencing and reforesting the land. This equitable arrangement has not been agreed to by the Trustees of the Parker estate, they stating that the financial affairs of the estate are in a such a condition that they are not justified in making any outlay for the purpose mentioned. Your Commissioner has urged upon the representatives of the Hamakua plantations the advisability of meeting this objection by offering to assume the cost of fencing the gulches in addition to the mauka fence. This proposition, I am assured, will meet with proper consideration, as the matter is one of great moment to the agricultural industry of Hamakua.

The planting interest of Kohala has also called the attention of this Bureau to the rapid deforestation of the upper lands of that district. Your Commissioner has informed the planters there of the action taken by the Hamakua planters, and advised that a meeting of the planters be held to adopt the same plan as that agreed to by the Hamakua planters, that is, the planters to do all the fencing and the Government to set aside all the land above a certain line for forestry purposes.

Letters have been received from private parties on Maui, stating the rapid destruction of the forests that is taking

place in the districts of Hamakuapoko and Kula. It is the intention of your Commissioner to visit Maui at an early date and confer with the planters and land owners, on the important question of preserving and reforesting the upper lands of the fertile districts of Hamakuapoko and Kula.

In order to encourage the reforesting of the denuded lands throughout the islands, I would suggest that the Government furnish the necessary seeds free of charge to all persons who will plant and care for them.

For two years in succession the districts of Hamakua and Kohala have suffered from severe and protracted drouths, causing great loss to the sugar planters of those districts, springs and natural reservoirs in the gulches diminished to such an extent that water for animals and domestic use was most difficult to procure, and in some instances water had to be taken from Honolulu in barrels. The cause of this serious state of things is accredited by the residents of those districts, and in the opinion of your Commissioner rightly so, to the unrestricted roaming of cattle in the forests until tens of thousands of acres of land, which were formerly a dense forest, are now but little better than a barren desert, useless alike to the grazier and the agriculturist.

In the district of Hamakua and South Kohala there are millions of dollars invested in our staple industry, and unless something can be done, and done immediately in order to give some security for the future, the greater part of the enormous capital invested will be lost, and the cultivation of sugar in the districts of Hamakua and South Kohala become a thing of the past.

The grazier too (if things are not soon changed) will suffer a serious loss, as year by year, the water supply for cattle is becoming scarcer and more distant. The cattle, as they en-

croach on the forests, destroy all before them, causing water holes and springs to dry up and disappear until soon there will be none left. When this occurs and occur it will, unless action is taken to prevent it, it will be too late to effect anything that will benefit this generation; it will then be a difficult matter to do anything at all, as the people in those districts (what there will be left of them) will be too poor to assist in any plan of reforesting the country.

Now, the planters of Hamakua (and no doubt the planters of South Kohala will do the same) have offered to bear all the expenses of fencing and planting a large portion of the deforested region, provided the Government will set apart the land for the purpose of growing and preserving a forest there. In the case of the Hamakua forests, the Government has already agreed with the planters of that district to co-operate in the plan proposed for preserving and reforesting the denuded regions, but the parties who own or lease the forest lands, while agreeing upon the necessity of preserving the remaining forests, object to doing that part of the work which allow their cattle access to water, while keeping them from destroying the forest. As this is a case of *pro bono publico* the Government should take the matter in hand, and by the power conferred by the law passed in 1876, entitled "An Act for the Protection and Preservation of Woods and Forests," set apart a sufficient area of the upper lands of Hamakua and Kohala for the purpose of maintaining a forest.

Section 4 of this Act is as follows: "Whenever it shall be necessary to extinguish any private right or title in any woods or lands required to fully carry out the intention of this Act, the fair valuation of the same shall be determined by referees agreed upon by and between the parties interested therein, and the Minister of the Interior, and the valuation

so adjudged and determined, shall be the extreme limit of the price to be paid by the Government for such woods and lands, and upon making tenders of such price so determined by the referees, it shall be lawful for the said Minister to take possession of such woods and lands for the purpose aforesaid."

EXPENDITURES.

Salary of Commissioner & Secretary,	12	months	$ 1,800 00
" Carl Willing (gardener),	14	"	1,190 00
" J. Silva (forester),	13	"	650 00
" D. Haughs (forester),	11	"	825 00
" H. J. Rhodes (forester)	10	"	889 00
Pay of 7 Chinese, 13 months			1,754 31
" 8 Japanese, 11 months			1,310 82
Salary of Prof. Koebele, $250 per month (one-half paid by the Planters' Labor & Supply Co., 6 months, $750			750 00
One-half expenses and incidentals of Prof. Koebele (one-half paid by Planters' Labor Supply Co., $174.90			174 90
Materials, supplies, etc			782 80
Freights, cartage, etc			170 85
Plants, seeds, trees			477 10
Extra labor putting out fires, etc			194 80
Stationery, books, stamps, periodicals			92 35
Repairs			26 25
Traveling expenses			67 00
Telephone			4 00
Advertising, printing, etc			53 00
Thomas Square curbing			319 72
Emma Square curbing			65 15
Saddle mule			66 00
			$ 11,663 05

ESTIMATES FOR THE COMING PERIOD, APRIL 1, 1894, TO MARCH 31, 1896.

Salary of Commissioner and Secretary	$ 3,600 00
One-half salary of Professor Koebele	3,000 00
One-half expenses and freights Prof. Koebele	2,000 00
Salary of gardener	2,040 00
Salary of forester	1,800 00
Pay of eight Japanese	2,880 00
Materials, supplies, fencing, etc	1,000 00
Freight, cartage, etc	200 00
Importation of plants, seeds, etc	1,500 00
Stationery, stamps, books and periodicals	200 00
Travelling expenses	250 00
Advertising, printing, etc	150 00
Telephone	48 00
Fiber machine and engine	2,000 00
House for gardeners at new nursery	1,600 00
Cost of removing large building to new nursery	300 00
Glass propagating house at new nursery	250 00
Cost of half-mile 4-in. pipe and laying same	1,400 00
Half-mile 2-in. pipe	528 00
One mile $\frac{3}{4}$-in. pipe	316 00
Sixty 2-in. tees with reducers	30 00
Hundred and twenty $\frac{3}{4}$-in. elbows	15 00
Sixty hose bibbs	60 00
Sundry fittings	50 00
Cost of laying and fitting branch pipe	100 00
Experimental cultivation of oysters	500 00
	$ 25,817 00

Respectfully submitted,

JOS. MARSDEN,

Commissioner of Agriculture and Forestry.

REPORT OF ENTOMOLOGIST.

SIR:—I have the honor herewith to submit to you a report of work done since my appointment, and notes upon a part of the injurious insects met with on this and other islands visited since my arrival.

Respectfully yours,

ALBERT KOEBELE.

HON. J. MARSDEN,

Commissioner of Agriculture and Forestry.

The number of noxious species of insects that were met with is rather large compared with those of a beneficial nature. In the first place are the various species of coccidæ or scale insects, the presence of which upon most of the trees and shrubs, not only make the success of certain industries almost impossible, but also will impart to these a most unsightly appearance.

As I have expressed myself before this, by the introduction of such insects and other enemies that prey upon the injurious species we eventually will overcome most, if not all, these as far as the coccids are concerned.

The most injurious scale insect at the present time, known as the rhizococus, living upon most of the trees and shrubs, and especially destructive to the most valuable trees such as the citrus, coffee and others, has been introduced here presumably from Japan within recent years, and as far as I know, through your efforts, as yet been kept on the Island of Oahu.

I am familiar with several predatious insects in Australia that will prey upon and keep this coccid in check if introduced here, and it shall be my first effort to get them in large numbers.

Another very numerous coccid apparently introduced here a long time since, and distributed all over the islands visited is pulvinaria psidi mask, described for me by Mr. Maskell in his work entitled "Transactions of the New Zealand Institute, 1892, p. 223," from specimens collected here during July, 1891. This also is found upon most any shrub or tree, and as yet, is comparatively free from enemies. Some three or four years since this insect made its appearance upon the pride of India trees, in North Kona, Hawaii, destroying many of these and spread to such an extent that, at the present time, it is one of the most numerous and injurious insects upon the coffee trees, and as Mr. Miller, of Kona, remarked, "It would be impossible to raise coffee trees with this scale always present." This insect was found to have already spread from the sea coast upwards to about 2,000 feet altitude, from north of Kailua to south of Hookena, a distance of about twenty-five miles. For miles away the black appearance of the guava forest show the presence of this coccid.

An effective enemy to this is already established in Honolulu, which also will successfully destroy all the numerous other lecanidæ found on the islands.

Indigenous species of aspidiotus were met with, hardly to be called really injurious, since they are preyed upon and kept in check by natural parasites of the chalcid family, whilst such that had been introduced upon plants from foreign countries are destructive in most instances. Aspidiotus aurantii, mask., the well-known red scale of California is present, as also the pernicious scale A. perniciosus, comstock. The first was met with on Oahu and the second on Kauai.

Other species of the same genus were met with upon plants introduced from Japan. Mytilaspis citricola, pack., was met with upon citrus trees introduced from California where, as yet, this scale is not generally found, and no doubt those trees came originally from Florida. Apparently the same insect, or a closely allied species, is found upon wild growing citrus trees at Hawaii. Other species of this genus, as well as chionaspis were met with upon plants imported from Japan.

Dactylopius is represented in numerous species, one of this, D. citri, boisd., is the so-called white louse of the coffee trees. At the present time it was found chiefly in its earlier stages and not numerous. Its most effective enemy is undoubtedly the larvæ of a species of lace-wing-fly, hemerobius, sp., this unfortunately, as well as the closely related species chrysopa, are preyed upon by numerous parasites which, at times, reduce their number considerably; and owing to this the mealy bugs again appear in numbers. A true parasite "chalcid" bred from this scale has been observed on all the islands. The natural enemies that will be introduced upon these scales will be many, and they will remain free of parasites for very many years to come, so as to be able always to keep this pest in check. Until these enemies are established, should the dactylopius again appear in destructive numbers, I would advise to spray the trees with resin compound, which is easily prepared by any one. Three pounds of washing soda (carbonate of soda) and four pounds of resin are boiled in two pints of water until well dissolved, then hot water should be added slowly while boiling, to make five gallons of compound. This should be diluted with cold water before cooling, to make about forty gallons of wash for the mealy bugs, or about sixty gallons for plant lice. I have always found this to be the simplest and most effective wash to prepare. Very effective and not injurious to plants.

In Brisbane, Queensland, a few years since, upon a small shrub in the botanical gardens, a waxy scale insect had been introduced and allowed to spread. During my visit to that place in 1892, this had spread over a large space of ground, covering many trees and shrubs. Dr. Bancroft brought me to a grove of mango trees near the city, which were literally covered with this scale, so much so that all the trees were nearly leafless, and in a dying condition. With the exception of the larvæ of a small moth, "thalpochares cocciphaga," that fed to some extent upon the same, no enemies were found. I felt some apprehension in discovering the same insect here, yet since it is distributed all over Honolulu and never numerous upon any plant, I do not fear any bad results, apparently an internal parasite is preying upon the same with us.

A fair representative collection of all the scale insects found was made. It will be worked up, and later deposited here with names.

On the Island of Maui a snout-beetle, otiorhynchid, is eating the leaves of many plants, shrubs and trees. I would recommend to spray the affected plants with paris green, in the proportion of one pound of this to about two hundred gallons of water. A little soap added to the solution will keep the poison on the foliage a much longer time. This will prove a very good remedy for all leaf-eating insects, and has also been recommended for caterpillars, destructive to the tomato, potato vines and other plants. One ounce of paris green mixed with four pounds of flour of sulphur, and dusted thickly over the rose and other affected plants, has so far proved one of the best remedies against that serious pest, the so-called rose bug adoretus umbrosus.

The following is a list of insects sent here from California with notes of their feeding habits:

Hippodamia ambigua, convergens, Lex. H., Guer. These are

the two commonest Lady Birds in California, and will feed both in larva and imago state upon all sorts of plant lice, aphidæ.

H. Sinuata, Muls. Is not so common, and will also feed upon plant lice.

Coccinella tri fasciata, Linn. With its two varieties, juliana and subversa, has also been sent in large numbers. They will feed upon plant lice.

C. Californica, Mann. Also came in large numbers. These will not only feed upon plant lice, but also upon various lecanium in their early stages.

C. Abdominalis, Say. Appears to be the insect already present upon the islands. Some good specimens of the same were also forwarded. This preys upon aphids as well as the various lecanium.

Cycloneda sanguinea, Linn. Is also preying upon plant lice, and large numbers have been sent.

Adalia humeralis, Say. Was always found with lecanium upon which they may be expected to feed. Many have been sent.

Psyllobora taedata, Lec. Lives upon injurious mildews in larvæ state on various plants and trees, and many have been sent.

Harmonia picta, Rand., was sent in large numbers. This also preys upon plant lice.

The most valuable scale-feeding coccinelledæ in America is undoubtedly *Chilochorus cacti, Linn.* It will prey upon most of the coccids, and especially the various *Aspidiotus* and *Lecanium.* Large numbers was sent here, and without doubt will increase and become as valuable here as in their native home.

Exochomus pilatei, Muls. Feeds upon the various *Lecanium.* and has also been sent in numbers.

E. marginipennis, Lec. I bred from larvæ feeding upon *Lecanium*, and sent many of the mature beetles.

The genus *Hyperaspis* are small black and bright marked Lady birds. I could not learn anything of their habits, yet from observations made, I am sure they will prey upon *Lecanium*, and perhaps upon *Dacty lopius* as well. Four species at least were forwarded, these are *H. osculans, Lec., H. undulata, Say., H. fimbriolata, Muls.*, and *H. postica, Sec.*

Hyperaspidius trimaculatus, Linn., was bred from larvæ feeding upon *Dacty lopius*, to which the so-called white aphis on coffee plants belongs. This insect has also been sent in numbers.

The genus *Scymnus* are usually small and somber colored insects, feeding upon various insect pests, such as plant lice, scale insects, red spider, etc. The species sent are *S. guttatus, Lec.*, found on plants infested with *Lecanium* and *Dacty lopius.*

S. nebulosus, Lec., was bred from larvæ feeding on plant lice.

S. pallens Lec., S. debilis, Lec., was only found feeding upon *Dacty lopius*, and very numerous. Amongst these are several species not yet described.

Rhopus dactylopii, How. Is a very minute little Chalcid fly, and was named for me by Mr. Howard of the U. S. Department of Agriculture, who has made this group of insects his special study. The parent insect stings the mealy bugs (*Dacty lopius*), and lays from a few to forty eggs within each, according to size. The little maggots live on the contents of the scale, and when full grown pupate inside, the eaten out mealy bug then drying up, and shortly after the minute, yellowish flies make their appearance. Large numbers of these have been introduced.

Of the recently introduced insects from Australia into Cal-

ifornia, three of the most valuable have been sent here. *Orcus Australasia, Boisd.*, which will prey upon various Coccids, such as Aspidinæ and Lecanidinæ. The insect has but two broods annually in Australia, and is rather a slow breeder compared with the following:

Rhizobius ventralis, Erichs., was sent here on two occasions, and a number were brought with me and liberated upon *Pulvinaria Psidi, Mask.*

From specimens liberated on Jan. 21, 1894, in this city, grown larvæ were found of same on Feb. 28th, showing the success of the introduction of one of the best enemies for this coccid as well as all the various *Lecanium.* The insect has also increased with Mr. Jordan, where specimens were liberated during December of '93. In California, I estimated six broods annually of this insect, as they breed continuously, and here we may expect at least eight broods annually. In about two months hence sufficient insects will be present at Mr. Jordan's place to collect and send the same to the other islands, in lots of about fifty beetles or larvæ. In my work in Australia this beetle will always be met with, and the same will be sent here with directions to liberate the same at other places.

Rhizobius toowoobat, Black, has been sent in numbers. These feed upon a variety of scales, and will prove of great value in devouring those small and destructive species, such as *Aspidiotus, Diaspis, Chionaspis, etc.* It also preys upon the Lecanidinæ.

REPORT

OF THE

ROAD SUPERVISOR, HONOLULU.

HONOLULU, March 31st, 1894.

TO HIS EXCELLENCY JAMES A. KING,
Minister of the Interior,

SIR:—I beg leave to submit to Your Excellency my period report, showing the work done and the amount disbursed by this Bureau during the period, beginning April 1st, 1892, and ending on March 31st, 1894.

The amounts which have been expended for street purposes during the period are as follows:

Macadamizing streets, Honolulu	$ 12,064 76
Repairs and care of roads, Honolulu, Sec. 1	30,000 00
" " " special	3,761 32
Roads and bridges, Honolulu, Sec. 2	20,000 00
" " " special	35,000 00
" " " general	8,433 65
Road tax, Honolulu	34,462 70
Total	$143,722 43

SIDEWALK CONSTRUCTIONS.

During the period Kekuanaoa street, from Halekauwila st. to Allen st., Fort street at Custom House block, Alakea st. from Queen st. to Halekauwila st., all were built from the appropriations for this Bureau.

MACADAMIZING STREETS.

A general statement of the work accomplished is as follows:

Alakea street has been graded from Queen st. to the Esplanade, bedded with large rocks and covered with macadam to a depth of eighteen inches. The Esplanade has been graded from the corner of Alakea st. to the corner of Fort st., bedded with large rocks, watered and rolled, and covered with macadam to a depth of twenty-four inches.

Beretania street, on the mauka side of the track, from Kapiolani st. to Punahou st., and on the makai side from Alapai to Punahou streets has been graded, bedded with large rocks, watered and rolled, and covered with macadam to a depth of sixteen inches on both sides, and is now completed.

Kekuanaoa street has been graded from Halekauwila st. to the Esplanade, bedded with large rocks and covered with macadam and Ewa rock to a depth of eighteen inches.

Halekauwila street, from Alakea st. to Fort st., has been graded, bedded with large rocks and rolled, and covered with macadam and Ewa rock to a depth of eighteen inches.

Edinburgh street has been graded from Queen to Halekauwila sts., bedded with large rocks, and covered with macadam and Ewa rock to a depth of eighteen inches.

GENERAL ROAD WORK.

Owing to several rain storms the roads out on the Plains have been washed out, and have caused this Bureau some unexpected outlay to repair them. The streets are as follows (most of them on steep grades):

Alapai st., Kapiolani st., Wilder avenue, Spencer avenue, Thurston avenue, Lunalilo st., Victoria st., Keaumoku st., Piikoi st. and Punchbowl st.

DITCHES.

The Makiki intercepting ditch has been undermined by the flood, and repaired at heavy cost.

During the last storm the Punchbowl ditch overflowed and broke through its embankment, greatly damaging Punchbowl street, besides doing other damage. Repairs have been thoroughly made.

BRIDGES.

Three new bridges have been built, one at Kamoiliili, one at Wailupe and the third at Ocean Beach road, and numerous other bridges have also been under general repairs.

VINEYARD ST. WING WALL.

To prevent any accident a stone wall was constructed, adjoining Peleula bridge, on the lower side, and now completed.

FLUMES OR WOODEN CULVERTS.

A general overhauling of flumes in all parts of the district has been made, and some have been removed and new ones substituted.

CULVERTS.

Culverts of various sizes have been built of bricks and stone. The following streets have had culverts built at proper crossings:

Alexander st., Metcalf st., the Esplanade, Kapiolani Park, Moanalua road, Piikoi st,, Keeaumoku st., Niu roads, Kekuanaoa st., Alapai st., Waikiki road, Kilauea st., Alakea st., Halekauwila st., Wilder avenue, Allen st., Pauoa road, Beretania st., School st., Ocean Beach road, Kapiolani st., Hackfeld st., Queen st., Fort st., Kamehameha lane, Beckwith st., Palama road, Puunui road, Victoria st., Emma st., Miller st. and Nuuanu st.

Wilder avenue culvert is a large one, constructed of brick arch. Many extension of culverts were built on Waikiki road.

ROADS AND LANES CONSTRUCTED.

Puunui road has been graded and opened from Judd street to Wyllie street stream, and filled with rocks and dirt. Prison labor has mostly been used on this class of work.

Waikiki road has been widened and graded from Mr. Chas. Hopkins' corner to Waikiki bridge, and filled in with rocks, white sand and Waikiki limestone and rolled. The work of this road is still in progress.

Nuuanu Pali road has been repaired and filled with rocks and dirt, from the Pali to the Electric Light House.

Waikiki lane has been graded and filled with Waikiki limestone and sand, at the joint expense of property owners and the Government.

Kamehameha lane has been built and filled with coral and rolled. The property owners furnishing the materials and the Government doing the work.

Emma st. and Vineyard st. have been graded, covered with Punchbowl rock and thoroughly rolled.

Metcalf st. and Miller st. have been graded and filled with rock and rolled, and are now completed.

Palama road (King st.), from the corner of Kamehameha lane to the corner of Kamehameha IV road, has been widened and filled with coral and rolled.

School street has been plowed and covered with rock, from corner of Emma st. to Fort st., and from west end of Waikahalulu bridge to Chas. Lucas' residence, and rolled.

WAIKIKI SEA WALL.

Since I took charge the Waikiki sea wall has had several falls, caused by its foundation giving away, and has given ex-

tra expense to this Bureau in repairing it from time to time. After repairing the breakage, I have laid along the whole length of the bridge, stone bowlders, five feet wide and three feet high, and this has been the cause of saving the whole wall from tumbling down.

STREETS TO BE REPAIRED, ETC.

Manoa road, Moanalua road, Waikiki road around Diamond Head, Panoa road, Tantalus road, Waialae road, Nuuanu Pali road, Liliha st., Nuuanu, from the sea to cemetery; Kekuanaoa st., Kilauea st., Alakea st., from Queen st. to Hotel st.; Emma st., Fort st., from the sea to School st.; Iwilei roads, Kakaako roads, Beretania st., from Punahou to Kaiulani st.; Maunakea st., Smith st., Hotel st., from Nuuanu to the river; Kekaulike st.

All proposed new roads or new work, your Excellency is undoubtedly familiar with, and in a position to know exactly what is needed.

I have the honor to be,

Your most obedient servant,

WM. H. CUMMINGS,

Road Supervisor, Honolulu.

REPORT

OF THE

SUPERINTENDENT OF WATER WORKS.

HONOLULU, March 31, 1894.

HIS EXCELLENCY J. A. KING,

Minister of the Interior.

SIR:—I have the honor to submit herewith my Report as Superintendent of the Bureau of Water Works for Honolulu, for the biennial period from April 1st, 1892, to March 31st, 1894.

APPROPRIATIONS.

The appropriations available for the work of this Bureau during the period were as follows:

Running expenses	$15,561 00
General repairs	10,000 00
Repairs to reservoirs	6,000 00
Dam and reservoir, Makiki	13,880 00
	$45,441 00

The items for Pumping Plant for Honolulu, $50,000.00; Purchase of Water Rights, Nuuanu, $11,500.00; and Purchase of Water Pipe for Honolulu, $12,750.00, coming under Section 2 of the Appropriation Bill, and the moneys not being available the appropropriations were not expended.

EXPENDITURES.

The expenditures for the period have been as follows:

Running expenses		$15,561 00
General expenses	$10,000 00	
Unexpended balance	2,989 13	
		7,010 87
Repairs to reservoirs	$ 6,000 00	
Unexpended balance	3,582 65	
		2,417 32
Dam and reservoir, Makiki	$13,880 00	
Unexpended balance	4,754 78	9,125 22
Total expenditures		$34,114 41

REVENUE OF THE BUREAU.

The actual receipts of the Bureau during the period were $85,017.50, which were received from the following sources:

City water rates	$72,307 15
Shipping	10,622 50
Penalties for turning on taps	207 50
Sale of taps	370 90
Ten per cent. charges	1,509 45
	$85,017 50

Showing an increase of $436.95 for the period. The amount outstanding March 31st, 1894, is $4,658.00.

NEW PRIVILEGES.

During the period 170 taps have been put in, of which thirty-nine replaced old ones, the remainder representing 131 new privileges granted with an estimated revenue of $4,660.00 for the coming period.

NEW RATES.

2	at	$ 5	00	per annum.
2	"	10	00	"
92	"	15	00	"
32	"	25	00	"
1	"	30	00	"
1	"	40	00	"
1	"	50	00	"

131 new privileges.

There is now a total of 2,099 paying rates, 132 having been cut off during the period for non-payment of rates.

INVENTORY.

Summary of inventory of property with estimated value belonging to this Bureau:

Office furniture	$ 3,923 00
Reservoirs	58,508 00
Pipe system	218,767 00
Pumping plant	10,000 00
Artesian wells	29,042 00
Material in store	18,058 00
Tools, horse, etc	3,691 00
Buildings	2,500 00
	$344,489 00

WORK PERFORMED.

The mains on Kewalo street, Keeaumoku street, Emma street, Alapai street, Kinau street and Miller street, were lowered for the new street grade.

NEW HYDRANTS.

During the period 15 standing fire hydrants have been placed in position as follows:

King street, 8; Queen street, 1; Fort street, 1; Kinau street, 2; Nuuanu street, 1; Pensacola street, 1; and Waikiki, 1; making a total of 86 standing and 111 ground hydrants in use.

BUILDINGS.

The keeper's house at Luakaha has been raised and new sills and underpinning put in. The gate house at the lower Nuuanu reservoir has been painted and is in good order.

The building lately occupied by the Government Nursery at Makiki has been turned over to this Bureau, and is now occupied by the keeper of Makiki reservoir. In exchange for this building this Bureau paid for the erection of a new house for the nursery on the Tantalus road.

PUMPING.

On the 14th of September, 1893, I made application to Your Excellency for the use of a steam fire engine, for the purpose of pumping from the Artesian well at Thomas Square into the mains, in order to further increase the supply of water during the drought of that year. On the 15th of September the Amoskeag fire engine was started to work, pumping directly into the Beretania street main, supplying all that part of the city east of Punchbowl street, including Waikiki and Kapiolani Park. The engine was kept at work for twenty-eight days until October 14th, 1893, when the drought ceased, and I was again able to supply the city from the reservoirs.

The cost of pumping twenty-eight days, including wages, coal, firewood, oil, waste and repairs to machinery was $598 or $21.36 per day of 14 hours. This amount was paid from

the appropriation for running expenses. This item, together with the amount expended for night watchman and extra guards during the revolution of January, 1893, caused the appropriation to run short and necessitated the asking of a further amount of $3,000 to carry on the Bureau until the end of the period.

SPRINGS AND RESERVOIRS.

During the drought the springs at Luakaha and the Halfway house were thoroughly cleaned so as to improve the supply.

The reservoirs at the Electric Light station and the Halfway House were cleaned and repaired. The lower Nuuanu reservoir which was leaking badly has been repaired, and is now in fair condition.

TRESTLE WORK.

The trestle work and dam at Luakaha was carried away during the late storm. I am at the present time repairing the same.

ARTESIAN WELLS.

Arrangements have been made with the parties having the use of the Artesian well at Pawaa, corner of King street and the Waikiki road, by which the Government can have the use of the well from 6 o'clock A. M. to 8 o'clock P. M. During these hours the well can be turned into the mains, supplying Waikiki and the Park, relieving the valley system. After these hours the well is used for irrigation purposes, the parties paying an annual rate of two hundred and fifty ($250) dollars.

The Artesian well bored during the last period on the property of Mrs. Dominis at Waikiki, is unfit for use, the water being salty, and it is claimed by the residents at Wai-

kiki, that it will not do for irrigation purposes as it kills the plants that are continually watered from it.

NEW MAINS.

Six hundred and six (606) feet of 3-inch wrought iron pipe was laid on the Pacific Mail wharf with the necessary hydrants.

One hundred and sixty-eight (168) feet of 2-inch cast iron pipe was laid to the Oceanic wharf, and three hundred (300) feet of 2-inch galvanized pipe was laid into Allen & Robinson's wharf.

Eight hundred (800) feet of 8-inch converse pipe was laid from the Makiki dam to the reservoir.

PUMPING PLANT, MAKIKI.

The most important work performed during the period was the erection and completion of a pumping plant at Makiki. The Artesian well at Makiki has been entirely useless since the completion of the boring, on account of the absence of the necessary appliances to raise the water to the pipe level for distribution. A contract was made with the McCandless Bros. to clean out the Artesian well at Makiki, the work was commenced August 1st, 1893, and completed in twelve days, at a cost of four hundred and seventeen ($417) dollars, including thirty-eight (38) feet of casing. A contract was also made with the Honolulu Iron Works Co. for one triple cylinder single acting brass pump of a capacity to discharge two cubic feet per second at the top of the well. The pump to be properly set on substantial foundations above the water level in the well, and to be so arranged that the valves in any one cylinder can be examined and renewed without disturbing the other two cylinders. The engine to be economical type, well set on substantial foundations, of sufficient capacity to oper-

ate the above pump, discharging not less than seventy (70) cubic feet per minute into the reservoir. A suitable ladder was constructed leading from the top of the well to the pump. A house constructed with corrugated iron roof and sides, including the boiler, engine and pump gear, was also furnished. The contract price being four thousand ($4,000) dollars.

The boiler was furnished by the Government, being the one formerly used to supply the power to the Palace electric plant.

The work was completed October 31st, 1893, and a satisfactory test was made, the pump discharging 1,500,000 gallons into the reservoir in twenty-four hours.

RECOMMENDATIONS.

PUMPING PLANT FOR HONOLULU.

In view of the necessity of insuring a supply of water during the seasons of drought. I would recommend the erection of a pumping plant at the old barracks; the building could be utilized for the purpose. It is proposed to use the Artesian well on the Executive building premises, and if necessary, to connect the well on the Mililani premises; these two wells would yield a supply of 2,500,000 gallons a day. What is required is a pump capable of handling the output of these two wells. An appropriation of $50,000.00 was voted by the Legislature of 1892 for this purpose. I am at the present time having prepared, plans and specifications for the proposed plant. Should this plant be erected, larger mains would have to be laid in the city.

KALIHI WATER WORKS.

A petition has been received from the residents of Kalihi praying that a water main be laid to that district. An appropriation was voted by the Legislature of 1890 to lay a line of 12-inch pipe along King street to Waller's brewery,

but the work was not carried out. I would recommend the laying of a 12-inch pipe to Kalihi, provided the proposed pumping plant is erected.

FIRE HYDRANTS.

I propose during the coming period to place in position the remaining fifteen standing fire hydrants which are on on hand, and would recommend, should funds be available, that additional fire hydrants be procured to take the place of the old ground hydrants, which are a nuisance and in some cases unfit for use.

RENTS OF LANDS.

I would recommend that steps be taken to obtain control of all water rights in Nuuanu valley, and also to purchase the lands of the Coney estate, Dickson estate and the Crown lands, thereby saving the $2,000.00 paid every period for the rents of the above lands for reservoir sites.

WATER METERS.

Disputes are continually arising between the water tender employed by this Bureau and the captains and owners of vessels over the capacity of the water tanks. Where the tanks are so situated that the measurements cannot be taken, the amount of water delivered is a matter of guess work. To remedy this I have ordered and intend attaching to the hose used to supply the shipping, a 2-inch Thompson Water Meter, making the usual charge of one-half cent per gallon for all water registered as passing through the meter.

CAPACITY OF THE DIFFERENT RESERVOIRS.

No. 3 Reservoir, Luakaha	galls.	10,712,130
" 2 " Half-way House	"	7,301,639
" 1 " Electric Light Station	"	21,304,211
Lower Nuuanu Reservoir	"	364,676
Makiki Reservoir	"	685,283
Total number of gallons		40,367,939

ESTIMATED REQUIREMENTS.

The system of mains at present in use are entirely too small, and it is absolutely necessary that provision be made to increase the size of the mains throughout the city. The following is a statement of what the mains should be:

LOCATION AND LENGTH OF MAINS PROPOSED TO BE LAID.

Queen st., from South to Kekaulike sts	4,380
King st., from Kapiolani to Punahou	5,150
King st., from Kapiolani to Bridge	6,700
King st., from Bridge to Waller's Brewery	11,500
Kinau st., from Quarry to Lunalilo	2,200
South st., from King to Queen	1,230
Punchbowl st., from Beretania to Queen	1,670
Alakea st., from King to Water Front	1,850
Kekaulike st., from King to Queen	380
Judd st., from Nuuanu to Liliha	1,875
Liliha st., from Judd to King	4,800
Total length in feet of 12-inch pipe	41,735

Estimated cost when placed in position, $108,511.00.

TEN INCH CAST IRON PIPE.

Beretania st., from Nuuanu to Smith's Bridge	650
Beretania st., from Alakea to Kapiolani	3,850
Beretania st., from Kapiolani to Punahou	5,300
Fort st., from Beretania to Water Front	2,880
Total length in feet	12,680

Estimated cost when in position, $25,300.00.

EIGHT INCH CAST IRON PIPE.

Richard st., from Beretania to Water Front	2,150
Quarry st., from Beretania to Kinau	1,425
Punchbowl st., from Queen to Immigration Depot	1,700
Piikoi st., from Beretania to King	630
Punahou st.; from Wilder avenue to King	2,500
Wilder avenue, from Makiki to Sea View	7,000
Water Front, from I. I. Wharf to Richard st	1,250
Merchant st., from Nuuanu to Richard	1,625
Hotel st., from Maunakea to Richard	2,150
Lunalilo st., from Pensacola to Makiki	2,125
Total length in feet	22,555

Estimated cost when in position, $34,640.00.

SIX INCH CAST IRON PIPE.

Prison road, from King st	3,200
Miller st., from Punchbowl	880
Punchbowl st., from Kinau to Miller	1,000
Smith st., from Beretania to King	1,100
Kuakini st., from Nuuanu to Liliha	2,125
Kukui st., from Nuuanu to Fort	525

Allen st., from O. S. S. Wharf to Richard	1,400
Halekauila st., from Fort to Richard	1,150
Total length in feet	11,380

Estimated cost when in position, $8,690.00.

FOUR INCH CAST IRON PIPE.

Adams lane	750
Union street	550
Kamakela	1,300
Chaplain street	440
Iwilei	1,800
Total length in feet	4,840

None of this need be purchased, as there will be enough taken up where larger pipes are laid.

Estimated cost of relaying, $2,230.00.

KALIHI.

Kalihi Valley road, 6-inch	970
Beckley street, 6-inch	1,300
Pahukui street, 4-inch	1,000
Kalii avenue, 6-inch	970
Rose lane, 3-inch	883
Total length in feet	5,123

Estimated cost when in position, $4,780.00.

While the above may seem a formidable list of improvements required, it is nothing more than what is needed to complete our water system. With the improved system of mains and a pumping plant erected in the city, there would be no further complaints during the seasons of drought from scar-

city of water. I would earnestly recommend that an appropriation be made for the proposed pumping plant, and also an appropriation to lay new mains on King street, and on all streets leading to the water front. This work should be attended to at once, as the demands for the supply of the shipping are greater now than heretofore, owing chiefly to the increased number of steamers now engaged in the foreign trade.

ERTIMATED ACTUAL REQUIREMENTS.

General repairs	$12,000 00
Repairs to reservoirs	8,000 00
Running expenses	8,500 00
	$28,500 00
Estimated revenue for the coming period	$95,000 00

ESTIMATED RUNNING EXPENSES OF THE BUREAU OF HONOLULU WATER WORKS, FOR THE PERIOD ENDING MARCH 31, 1896.

Rents of lands	$2,000 00
Coal, waste, oil, etc., for pump	1,800 00
Horse, feed and shoeing	1,440 00
Printing, advertising and stationery	926 00
Rent of Telephones	832 00
Hose, 500 feet	500 00
Tools	300 00
Horse	250 00
Brake and repairs	180 00
Medical services and medicines for horse	100 00
Harness	75 00
Taps and stop cocks	97 00
	$8,500 00

I have the honor to be,

Your Excellency's obedient servant,

ANDREW BROWN,

Superintendent of Honolulu Water Works.

REPORT OF THE CLERK OF THE MARKET.

OFFICE OF THE CLERK OF THE MARKET,

HONOLULU, March 31st, 1894.

HIS EX. J. A. KING,

Minister of the Interior.

SIR:—I have the honor to submit herewith my Report as Clerk of the Market for the biennial period, extending from April 1st, 1892, to March 31st, 1894.

RECEIPTS.

The receipts for the period have been as follows:

Rents from stalls	$ 6,993 00
Rents from tables	4,241 50
Rents from transient dealers	1,121 35
Bonuses from choice of stalls	4,235 00
Total receipts	$16,590 85

The receipts show an increase of $3,295.00 from the following sources:

Increase from rents of stalls	346 50
Increase from rents of tables	488 90
Increase from bonuses	4,235 00
	$ 5,070 40
Decrease from transient dealers	1,775 40
Net increase	$ 3,295 00

EXPENDITURES.

There has been expended from the appropriation of $2,000 for repairs and running expenses of market the sum of $1,216.40 as per vouchers on file in the Interior Office, leaving an unexpended balance of $783.60.

ESTIMATED RECEIPTS.

The estimated receipts for the coming period from rents alone are $13,000.00, but should the new building be completed the estimated receipts would be $17,000.00.

NEW MARKET BUILDING.

I would respectfully recommend that steps be taken to have the new market completed, or a new building erected on the site of the present market, which could be enlarged to take in the lot now occupied by the lime kiln, and which seems to be the most convenient location.

PEDDLING.

I would also recommend that the peddling of fish, etc., in the streets of the city be prohibited. A number of the dealers have been compelled to give up their stalls in the market, being unable to pay the rent caused by this wholesale peddling of fish by the Chinese. It is an injustice to those who have paid a large sum as a bonus for the stalls to be compelled to give them up. It has also caused a falling off in the market receipts during the period of $1,775.40.

ESTIMATES FOR THE COMING PERIOD.

Repairs and running expenses..... $2,000 00

I have the honor to be,

Your Excellency's obedient servant,

ANDREW BROWN,

Clerk of Market.

REPORT

OF THE

SUPERINTENDENT OF PUBLIC WORKS.

His Ex. J. A. King,

Minister of the Interior.

Sir:—During the first part of the period the office of Superintendent of Public Works was filled by Mr. H. W. McIntosh, who died suddenly Nov. 16th, 1892, and I received the appointment to the place Dec. 1st.

The necessity for economy in this Bureau has been strongly felt throughout the period, and a number of needed improvements for which appropriations had been made, have not been touched. The more important of these are comprised in the following list:

PUBLIC BUILDINGS.

Repairs Kohala Jail and keeper's house	$ 1,200 00
Court House and lock-up, Kipahulu	1,500 00
Enlarging Court House at Waiohinu	1,500 00
" " " Honokaa	2,000 00
New Market	25,000 00
Central Fire Station	50,000 00
Addition to the Post Office	4,000 00
New Wash Houses	7,500 00
New Powder Magazine	6,000 00
New Vault Survey Office	3,500 00
	$102,200 00

ROADS AND BRIDGES.

Nuuanu Pali road	$ 37,000 00
Road from Kukulu through Puna	30,000 00
" through Kula	10,000 00
" Makena to Kula	10,000 00
" Kohala to Waimea	2,000 00
" Lahaina to Maalaea	5,000 00
	$ 94,000 00

LANDINGS AND BUOYS.

New Wharf, Kaunakakai	$ 1,500 00
Landing, Kula, Puna	1,000 00
" Hoopuloa, South Kona	500 00
" Hookena, "	1,000 00
Wharf at Napoopoo	500 00
" " Keauhou	600 00
" " Honoipo	400 00
Mooring, "	500 00
	$ 6,000 00

MISCELLANEOUS.

Wailuku Water Works	$ 15,000 00
Survey for Sewerage System, Honolulu	2,000 00
Breakwater, Waimea, Kauai	1,500 00
	$ 18,500 00

A total of over $220,000.00 unexpended, chiefly for lack of funds. The more important of these will be mentioned later on as desirable to be accomplished during the coming biennial period.

In spite of so many things left undone, considerable has been

accomplished in the way of new improvements under the following appropriations:

BUILDINGS.

Jail at Kohala		$ 1,551 00
Jail at Hamakua		1,727 50
New Kerosene Warehouse		475 40

ROADS AND BRIDGES.

Bridge at Wailua, Kauai		9,597 37
New road between North and South Kohala		1,022 29
New roads, Kau		5,020 43
Volcano road (Prison Lunas, $4,610.40)		52,464 87
Roads and bridges, North Kona		1,606 98
" " South Kona		1,551 50
" " North Kohala		1,167 20
" " General (includes following:)		3,003 00
Bridge, Waimea, Oahu	$1,290 91	
Paumalu bridge	817 02	
Anahulu bridge	490 66	
Nuuanu bridge	249 15	

WHARVES, ETC.

Dredging Honolulu Harbor and bar	94,901 96
Dredging Honolulu Harbor	17,700 68
New Wharves and sea wall, Honolulu	8,563 90
	$200,354 88

DREDGING HONOLULU HARBOR BAR.

The most important of all the improvements accomplished during the period is the cutting of a channel through the bar, having a depth of 30 feet at mean low tide and a width of 200 feet.

This work was begun in last period ; a hydraulic dredger built and a retaining wall constructed on the reef at Kaakukui to receive the debris from the bar.

A contract was made with the Risdon Iron works of San Francisco to dredge the channel for the sum of $49,000.00, the Government furnishing the Dredger, pipe line and discharge basin. Considerable delay in beginning the work was occasioned by rough weather, and when the work was begun the contractors found it necessary to abandon the use of the revolving cutter and the "spud" mooring, on account of the wave motion of the sea.

A cast iron mouth piece was connected to the suction pipe by means of a flexible pipe, and with this it was found that the sand of the bar could be drawn in to the full capacity of the pipe, with no other means of loosening it up except that furnished by the current of water sucked in by the pump.

The "spud" mooring which is used to such advantage in smooth water was replaced by anchor moorings, with which it was difficult to keep the Dredger in exactly the desired position, and the results were far less uniform than are expected in smooth water. After removing the required quantity of sand, the bottom was found to be a succession of hummocks and pits, and the contractors faithfully expended considerable time and money in removing and leveling down the hummocks, so that when the work was finally accepted, the depth of water in the channel was at no point less than that required by the contract.

The amounts expended during the two periods are as follows:

	1892.	1894.	TOTAL.
Dredger	$ 51,253 59	$ 17,090 05	$ 68,343 64
Outfit	373 35	8,583 78	8,957 13
Surveys	2,075 87	696 87	2,772 74
Discharge Basin	33,807 11	7,453 52	41,260 63
Pipe line	6,242 61	5,334 43	11,577 04
Dredging bar		49,832 75	49,832 75
Dredging harbor	220 88	32 00	252 88
Miscellaneous	400 10	5,224 46	5,624 56
Reps. & care of Dredger		654 10	654 10
	$ 94,373 51	$ 94,901 96	$189,275 47

The contract price of the Dredger, without the working outfit, was $65,000.00.

After the contract was made certain changes and addition were decided upon, which involved an additional expense of $3,343.64.

Under the contract the working outfit was turned over to the Government at cost, on the completion of the dredging of the bar, making the total cost of Dredger and outfit, $77,300.77.

The item miscellaneous includes the following:

Interest	$ 4,580 89
Superintendent	550 00
Attorney's fees	270 00
Advertisements	190 10

The contract price for dredging the bar was $49.000.00 as above.

In addition to this the contractors were paid $750.00 for extra work entailed by reason of wreckage, which was struck

buried in the sand on the edge of the channel as originally staked out. The sum of $82.75 was also expended by the Government in preparing and placing buoys to mark the line of work.

After the completion of the channel the harbor was dredged to a depth of 28 feet along the front of the Pacific Mail wharf.

In this work considerable hard material was encountered, but the revolving cutter of the new Dredger proved equal to the difficulty.

A coral ledge covering no small area was removed, and beneath this was found a compact black sand, which wore off the teeth of the cutter far more rapidly than the coral.

A distance sufficient to accommodate the largest steamers calling at this port was dredged before the 8th day of May, and the whole was completed by June 1st, 1893.

The first steamer which took advantage of the increased depth on the bar was the *Qceanic*, which came into the harbor on the 9th of May, 1893.

Besides the work in front of the Pacific Mail wharf the Dredger was operated during the months of August, September, October and November, in the upper part of the harbor, securing an average depth of 25 feet for an area of about 100,000 square feet along, and in the vicinity of Brewer's and the Old Custom House wharves.

On the Ewa side of Brewer's wharf was a coral ledge, which has always prevented the use of that berth for any vessel drawing over 15 feet. This was found to be so hard that the cutter of the Dredger could not tear it to pieces, and it become necessary to resort to blasting. Fifteen holes were drilled to a depth of from 9 to 11 feet, and the rock was loosened sufficiently to be removed, and the depth of water increased to 22 feet.

The whole amount expended from the appropriation fo dredging harbor was as follows:

Pay rolls	$ 6,378 55
Coal	4,017 31
Repairs and expense	3,555 17
Total cost operating Dredger	$13,951 03
Discharge basin and pipe line	2,583 33
Blasting near Brewer's wharf	431 32
Care of Dredger	735 00
Total	$17,700 68

NEW WHARVES AND SEA WALL.

The amount expended from this appropriation, $8,563.90, was for material for two new wharves to take the place of Cooke's wharf, the Old Custom House wharf and Sorenson's wharf.

This change was recommended in the report of Superintendent of Public Works in 1888, and will be a great improvement to that part of the harbor.

The first wharf will be 240 feet long and 80 feet wide, and will be 100 feet on the Ewa side of Brewer's wharf.

The second wharf will be 200 feet long by 80 feet wide, and will be 110 feet from the first. Work on the first, which may be called Nuuanu st. wharf, has been commenced at the close of the period.

It is estimated the two wharves will cost $27,000.00.

VOLCANO ROAD.

The road from Hilo to the Volcano was begun in March, 1889, and on March 31st, 1894, it was completed to a point, 250 feet beyond the twenty-eight mile, leaving nearly three

miles to be constructed. This will be accomplished about the end of July.

For the first half of the period the work was in charge of W. W. Bruner, whose experience and good judgment in road making, as well as his engineering skill, have been very valuable.

To my regret he left for California in July, 1893, and since then Mr. John Moore has had charge of the work.

At the beginning of the period a gang of over 80 day laborers was employed besides 50 prisoners, but in October, 1892, in order to cut down the expenses, as far as possible, without actually stopping the work, the day hands were discharged, and the work continued through the period with prison labor alone.

The amount expended during the period from the appropriation for Volcano road is $52,464.87, which includes the amount of $7,593.49 due for work done previously, leaving for the work of the period $44,871.38. To this should be added $3,517.76, the cost of ten dump cars and 1½ miles of track purchased just at the close of the last period, making $48,389.14, the total cost of 10.13 miles of road completed during the period, an average of $4,776.81 per mile.

The amounts expended and the miles of road completed during each period are as follows:

	Miles Comp'd	*Expended.*
Period ending Mar. 31st, 1890....	9.50	$ 29,997 58
" " " " 1892....	4.61	36,920 56
" " " " 1894....	10.13	52,464 87
Total.....	24.24	$ 119,383 01

Average cost per mile $4,925.04.

This includes the expense of buildings and the transportation of supplies for the prisoners, but nothing for their labor.

There has been an average of about 72 prisoners daily on the work during the period.

PETER LEE ROAD.

For a number of years the Government road from Pahala, in Kau, to the Volcano has been practically abandoned, and a private road built and owned by Mr. Lee has been generally traveled.

The Legislature of 1892 passed an appropriation for the purchase of this road, and practically it was turned over to the Government in December, 1892; but the formal transfer was only completed in January, 1894. The purchase price being $4,500.

According to your instructions I made an examination of this road in August, 1893, and under date of September 7th, made a detailed report recommending the purchase of the road by the Government. This is the main road for travel between the districts of Hilo and Kau, and until last October was the only road by which carriages could go to the Volcano.

Nothing has been done on the road by way of repairs for a long time, and it is now a very uncomfortable carriage road. The Kau Road Board should be instructed to put it in order, and in addition, certain portions crossing the lava flows should be regraded and reconstructed, and finished with the traction engine now in use on the Volcano road.

NEW ROADS, HAWAII.

In Kau there has been spent $5,020.43, chiefly on three bridges on the new road between Hilea and Pahala.

In South Kona the work begun in the previous period on

the road through Pahoehoe was continued till the end of June, 1892, and some work was done on the Kalahiki road.

Amount spent on the Pahoehoe road	$1,261 50
Amount spent on Kalahiki road	290 00
Total	$1,551 50

In North Kona, also, the work on the Kohanaiki road was continued to the end of June.

The amount spent was $1,566.98, but the road is not completed.

The grading is done, but before the road can be used by teams it should be finished by a good top dressing, well rolled.

In this district $40.00 were spent on the survey of the Keauhou road, making a total of $1,606.98.

In North Kohala $967.20 was expended on the survey of the new road from North to South Kohala, and $200.00 for right of way and fencing on this road through the lands of the Union Mill Co. and Puehuehu Plantation Co., a total of $1,167.20 from the appropriation for roads and bridges, N. Kohala; also, $1,022.29 from the special appropriation for the road between N. and S. Kohala, was paid for fencing, etc., through Puuhue ranch.

ROADS, OAHU.

Early in the period $1,082.73 was expended in repairs on the Nuuanu Pali road, and from the appropriation for roads and bridges, general, there were spent $1,290.91 on the Waimea bridge, a portion of which had been washed out in a heavy storm; and $817.02 on a new bridge at Paumalu, and $490.66 on a foot bridge across the Kawailoa stream at Waialua. Both of these bridges had been carried way in the same storm.

Since the completion of the Paumalu bridge a freshet of unprecedented height has carried it to sea.

Two hundred and forty-nine dollars and fifteen cents was also spent in repairing the bridge on Nuuanu avenue, across the Nuuanu stream. The balance expended under this Bureau from roads and bridges, general, is $41.00, for care of horse and tools in Kona, $79.50 for traveling expenses of Superintendent of Public Works, and $30.56 for Pali road.

BRIDGE AT WAILUA, KAUAI,

The steel bridge purchased in 1890 for Wailua, Kauai, has been erected. It is a Warren truss bridge, 360 feet long, in three spans of 120 feet each. The roadway is 12 feet wide, the floor being made of one-fourth inch buckled plates, covered with the best road material to be found in the vicinity. The abutments are of stone laid in cement mortar.

On the south side of the river the foundation of the abutment is the solid ledge of rock forming the bank of river; on the north side, a foundation was made by driving piles two feet apart over the whole space to be occupied by the walls of the abutment. These piles were cut off below the ordinary water level. The sand was excavated between them to a depth of one foot below the pile heads, and this space filled with concrete, which was continued to a height of one foot above the pile heads. Upon this foundation the abutment was built of stone as on the south side.

The two intermediate piers are built of ohia piles, driven to an average depth of 26 feet below ordinary water level, 16 piles in each pier, with two additional wing piles on the upstream side, to the heads of which a sloping timber is secured so that floating debris will be lifted by the current, instead of packing down against the pier in a mass.

The piles are spaced so that, if desired, at any future time, iron piers can be constructed in the space between them.

The amount spent on this work during the period was $9,597.37.

This bridge occupies an important place on the main road around Kauai, and will be much appreciated by the traveling public.

It will be opened to the public about the middle of May.

NEW BUILDINGS.

The only new buildings erected for the Government during the period are two jails, one at Kohala and the other at Honokaa, Hawaii; and a small kerosene store house.

The jails were very much needed at both places. The one at Kohala contains six cells, 8x12 and 9ft. 6in. high. It was built by contract, by Messrs. Dall and Howie, for $1,545.00, extra work $6.00, total $1,551.00. The Hamakua jail at Honokaa is built on the same plan, but contains eight cells. P. A. Anderson was the builder. Contract price $1,716.50, extra $11.00, total $1,727,50.

The kerosene is stored at present in the buildings formerly occupied by the Kapiolani Home.

These were inadequate, owing to successive large importations, and it became necessary to build a house 100ft. by 20, which will hold 8000 cases.

The appropriation for addition to Insane Asylum, $566.50, was the final payment due for a cottage at the Insane Asylum, and some minor additions completed just at the close of the previous period.

REPAIRS FURNITURE AND ADDITIONS GOVERNMENT BUILDINGS.

This appropriation has been expended as follows:

Department Buildings, Honolulu.

Executive building	$ 1,475 06		
Judiciary "	2,387 64		
Kapuaiwa "	91 48		
Treasury vault	221 25		
Custom House	1,030 62		
Police Station	536 00		
Oahu Prison	495 79		
Government storehouse	24 05		
Harbor Master's office	25 90		
Post Office	577 36		
		$	6,865 15

Buildinys for Military,

Bungalow	$ 124 05		
Old Barracks	747 03		
Drill shed	394 38		
Barracks' kitchen	40 50		
Moving offices to Executive building	56 75		
		$	1,362 71
Executive building sidewalk, King st.	$ 573 70		
" " " Richards	437 20		
" " fence	349 50		
Queen and Richards sts. sidewalk	20 80		
Dispensary sidewalk, King st	28 40		
" " Merchant st	50 10		
Judiciary building sidewalk, King and Queen sts	714 77		
Judiciary building, gate	31 22		
Hilo Court House fence	30 63		2,236 32
		$	10,464 1

Buildings Yielding Revenue.

Old Custom House	$ 89	06	
Honolulu Hale	71	88	
Kerosene store	134	33	
Fish Market	57	01	
Powder magazine		75	
		$	353 03

Court Houses and Jails outside Honolulu.

Kohala Court House	$ 12	10	
Kohala Jail	8	25	
Honokaa Jail	195	00	
Hilo Court House	437	21	
Puna Court House	20	00	
Hookena Court House	3	50	
Kailua Court House	24	50	
Wailuku Court House	80	75	
Wailuku, Sheriff's office	25	00	
Wailuku Jail	49	52	
Makawao Jail	5	00	
Hana Court House	18	37	
Lahaina Court House	13	56	
Lahaina Jail	27	70	
Pukoo Court House	31	25	
Ewa Court House	36	40	
Waianae Court House	13	37	
Waialua Court House	6	25	
Kaneohe Court House	33	75	
Koloa Court House	229	50	
Lihue Court House	25	75	
		$	1,296 63

Miscellaneous.

House to Mitigate	$ 16 27	
Royal Mausoleum	308 62	
Forester's building	1 20	
Gate house Judd Hill	21 00	
Watchman's house, Luakaha	139 71	
Pilot's office and lookout	162 37	
Removing lanai, Executive Building yard	69 25	
	$	718 42

GENERAL EXPENSES PROVISIONAL GOVERNMENT.

Considerable work has been done by this Bureau under the appropriation for general expenses of Provisional Government.

A powder magazine was constructed in the Barracks at a cost of $456.50; a floor was laid in the drill shed, and company rooms partitioned off for $720.90. Fitting up and repairing kitchen, and new quarters for the military in the Executive Building was done to the extent of $665.66

LANDINGS AND BUOYS.

The expense of repairs to wharves in Honolulu was unusually heavy on account of extensive repairs at the Pacific Mail wharf, rendered necessary by the dredging of the berth along the wharf. Some of the original piles did not reach to the 28ft. depth made by the dredging, and when the planks were removed to drive new piles, it was found necessary to replace a large proportion of the old timber with new.

An addition of 10ft. was made on the Ewa side of Brewer's wharf, and this, in connection with the excavation, has made a berth which will accommodate any of the packets that come

to the harbor, whereas before nothing drawing over 15ft. could be berthed there.

The amount expended during the period is as follows:

	Landing & Buoys Honolulu.	Landing & Buoys General.	Total.
Pacific Mail wharf	$ 5,152 81	$ 1,413 41	$ 6,566 22
Likelike "	328 76	162 49	491 25
Kinau "	441 83	90 39	532 22
Kekuanaoa "	1,063 24	216 57	1,279 81
I. I. S. N. Co. "	793 73	411 54	1,205 27
O. S. S. Co. "	1,430 35	296 81	1,727 16
Allen street "	7 00	.....	7 00
Brewer's "	154 33	1,898 89	2,053 22
Cooke's "	252 45	25 20	277 65
Old Custom House wharf	372 85	65 15	438 00
Sorensen's "	474 14	1 25	475 39
Fishmarket "	162 10	5 60	167 70
Cattle "	77 02	2 48	79 50
Quarantine "		6 40	6 40
Immigration "	9 75	.....	9 75
Boat landing	36 21	.....	36 21
Anchors and Buoys	583 98	128 20	712 18
Pile Driver	213 39	209 09	422 48
Telephone	45 00	9 00	54 00
Miscellaneous	401 06	262 05	663 11
Hilo wharf	.....	211 36	211 36
Kaawaloa wharf	.....	57 61	57 61
Kailua wharf	.....	109 79	109 79
Keanae landing	.....	53 64	53 64
Harbor Master, Lahaina	.....	60 00	60 00
Waianae wharf	.....	302 31	302 31
	$ 12,000 00	$ 5,999 23	$ 17,999 23

Besides these amounts there are unpaid bills on account of landings and buoys, Honolulu, amounting to $2,215.13, chiefly on account of the repairs and extension of Brewer's.

The continued expense of renewing the planking of the wharves will probably make it worth while to cover some of

the other wharves with block pavement, such as was laid on the Likelike wharf in January, 1890.

In the four years not a dollar has been spent in repairing this block pavement surface; the repairs to Likelike wharf in the above schedule being chiefly for a small addition on the makai end of the wharf, and the balance for the outer edge of the wharf which is only planked. In constructing the new wharf to replace Sorenson's wharf, it is proposed to adopt this plan. The first cost of laying the block pavement is much greater than that of the ordinary planking, but the durability will probably make it more economical in the long run.

PILE DRIVER.

The floating pile driver had been in a very bad condition for some time, and finally went to pieces. The deck and timbers were so rotten, the only wonder is, that it held together so long. We have used one of the old dredger scows temporarily to drive piles from, but the floating capacity is quite insufficient, and more than once it has capsized.

A new pile driver should be built at once, and as there might be some question as to the propriety of building it from the appropriation for new wharf, I will ask for a special appropriation of $2,500.00 for the purpose.

The repairs to landings on the other Islands from special appropriation for landings and Buoys have been as follows:

HAWAII.

Hilo wharf		$ 315 49	
Laupahoehoe	wharf	375 21	
Pohoiki	"	226 42	
Kailua	"	81 05	
Kaawaloa	"	1 83	
			$ 1,000 00

MAUI.

Hamoa wharf	$ 285 10	
Keanae landing	14 90	
Harbor Master, Lahaina	150 00	
		450 00

MOLOKAI.

Kaunakakai Buoys	211 65

KAUAI.

Nawiliwili wharf	104 50	
Waimea "	319 34	
		423 84
Landing at Kula, Puna		2 35
" Hookena, South Kona		39 50
" Makena, Maui		232 36
Wharf at Maalaea		422 65
" mooring and breakwater, Lahaina		637 80

HILO WATER WORKS.

The operating expenses of the Hilo Water Works have been as follows:

Salary of Superintendent		$ 1,600 00
Repairs	$ 59 54	
Sundry fittings	85 95	
Stationery	22 95	
Office rent	52 00	
Team	272 00	
Traveling expenses	25 00	
		517 44

TUG ELEU.

The repairs and running expenses of the steam tug outside of the pay rolls have been as follows:

Coal	$ 3,077 50	
Repairs and expense account	2,785 93	
		$ 5,863 43

She was hauled up on the Marine Railway June 21st, 1892, and again Aug. 10th, 1893. Her deck has been caulked, a new smokestack put on, and she is in fair running order.

LIGHT HOUSES.

The repairs of lighthouses have been as follows:

Honolulu Harbor light	$ 6 50	
Inner "	19 50	
Waialua "	38 75	
Barber's Point "	90 37	
Kaunakakai "	4 00	
Maalaea "	40 50	
Laupahoehoe "	86 34	
Paukaa "	41 50	
		$ 367 96

ELECTRIC LIGHT, HONOLULU.

The repairs and running expenses of the electric light works have been as follows:

Superintendent	$ 4,200 00	
Labor	10,429 47	
Teams	1,474 25	
Repairs and expense account	4,984 98	
		$ 21,088 70
The amount collected during the period for lights is		8,010 90
Balance		$ 13,077 80

which may be said to be the net cost of the Government lights for the period.

The number of arc lights now in operation is 102, and incandescent lights are furnished free of charge as follows:

Military	126	
Post Office	19	
Police Station	10	
Fire Department	23	
Streets	9	
Honolulu Library	18	
Hotel Band Stand	128	
		333

More arc lights are very much needed for the streets which can be operated by our present water power, only by giving up the incandescent system. If it should be decided to do this, it will be necessary to provide for additional plant for the arc light system as follows;

1 Dynamo	$ 5,000 00	
50 Arc Lamps	5,000 00	
Poles, wire and erection	10,000 00	
		$ 20,000 00

and the expense of another trimmer and the required carbons must be provided.

In case the present system is continued, there will be required for repairs and additions:

10 Arc Lamps,
One 50 Light Armature,
100 Poles,
40 Suspension outfits,

which with extra labor will cost $6,700.00.

Following is the report of Mr. Andrew Brown, collector of rates for electric lights furnished by the Government:

HONOLULU, March 31st, 1894.

W. E. ROWELL, ESQ.,

Superintendent of Public Works.

SIR:—I have the honor to submit herewith my report as collector of rates for the Government Electric Lights, for the biennial period from April 1st, 1892, to March 31st, 1894.

The amount collected during the period from rents was $8,010.90.

The amount outstanding Mar. 31st, 1894, was $1,338.00.

There are at the present time nineteen paying rates using 598 lights, the receipts being $329.80 per month.

The estimated receipts for the coming period, at the present rate, are $7,900.00.

Respectfully submitted,

ANDREW BROWN,
Collector Government Electric Lights.

INCIDENTALS.

This appropriation has been expended as follows:

Stationery	$144 82	
Papers, magazines, etc	78 85	
Postage stamps	32 84	
Telephones (two)	129 25	
Traveling expenses	19 00	
Hack hire and horse feed	27 50	
Draughting, Tools, etc	31 80	
		$464 06

STREET GRADES.

During the period the Commissioners of street grades have formally established the following street grade:

No. 35. Street—Nuuanu st.; Limits—Beretania to Hobron's lane; Date, 1892—October 25th.

BUILDING PERMITS.

Two hundred and thirty-five (235) applications for permits to erect, move, alter or repair buildings have been received, of which all but one were granted.

A fee of five dollars has been collected for each one of these permits excepting No. 8 to the Honolulu Road Board, making a total of $1,170.00 received for permits. Up to Mar. 3rd, 1893, these fees were collected by the Fire Marshal, but since the law was passed abolishing the office of Fire Marshal, the fees have been collected in this office.

Following is the list of applications:

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.

Date.	No.	Owner or Applicant.	Character of Building.	Location.	Purpose of Building.
1892					
April 13	1	K. R. C. Wallace	1 story frame	Beckley st	Dwelling.
" "	2	Lam Wai	1 story frame	Maunakea st	Store.
" "	3	Tong On	Alteration	Nuuanu st	Store.
" "	4	T. H. Davies & Co.	1 story brick	Kaahumanu st	Warehouse.
" 15	5	J. H. Makole	2 story frame	Kikihale	Dwelling.
" 19	6	C. J. Fishel	Alteration	Cor. Hotel & Fort st.	Meeting Room (Fire Police).
" 22	7	Y. Ota	Addition	Queen st	Store.
" 23	8	Hon. Road Board	Tool house	Govern't Yard, Hon.	Tool House.
" 27	9	Hopkee	Alteration	King st	Restaurant.
" 29	10	W. C. Peacock	1 story frame	Queen st	Storehouse.
May 2	11	Awaihiona	1 story frame	Puukoli	Dwelling.
" 3	12	Leong Fook	1 story frame	Rear 121 Maunakea st	Dwelling.
" 5	13	Ho Mau	2 story frame	Pauahi st	Dwelling & workshop.
" 6	14	A. Madeiras	Moving	Alapai and Kinau st.	Dwelling.
" 9	15	Ah Ping	1 story frame	Fort st	Dwelling.
" 9	16	Tuck Chan	1 story frame	Kamanuwai	Dwelling.
" 16	17	F. Gertz	Alteration	Fort st	Photograph Gallery.
" 25	18	F. W. Damon	1 story frame	Chaplain st	Out House.
" 25	19	Queen's Hospital	1 story frame	Queen's Hospital	Dwelling.
" 25	20	Wing Chong	2 story frame	Beretania st	Dwelling and Store.
" 25	21	C. K. Ai	2 story frame	Hotel st	Dwelling and Store.
" 31	23	Wing Chung Tai	2 story frame	Hotel st	Dwelling and Store.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

Date.	No.	Owner or Applicant.	Character of Building.	Location.	Purpose of Building.
1892.					
May 31...	23	Wing Chung Tai	2-story frame	Rear Hotel st. near	Dwelling and Store
June 3...	24	Mrs. Vida	1-story frame	King st	Dwelling.
" 6...	25	Pac. Iron Works.....	Repairs	Cor. Queen & Alakea.	Store
" 6...	26	N. Fernandez	Addition	Insane Asylum road..	Dwelling.
" 20...	27	Lucy P. Mahoe.....	1-story frame	Thurston avenue	Dwelling.
" 20...	28	Union Feed Co.....	Shed	Queen st.....	Warehouse.
" 21...	29	W. Ahana	Alteration	Nuuanu st.....	Store.
" 24...	30	J. C. Quinn	1-story frame	Corner South st, and Quinn's	Dwelling.
" 24...	31	Dr. Foote.....	Moved	Punchbowl & Beretania sts.....	Dwelling and Office.
July 1...	32	See Sing	Alteration	Fort st.....	Store.
" 1...	33	Ahi.....	Alteration	Nuuanu st.....	Store.
" 1...	34	J. J. Williams	Awning	Fort st.....	Awning.
" 2...	35	Fashion Stable Co...	Alteration & addition.	Fort st.....	Stables.
" 2...	36	G. Waller	Moved	Hotel & Union sts...	Office.
" 6...	37	W. O. Smith	1-story frame	Nuuanu & Hobron lane	Stable.
" 11...	38	Mahelona Estate	1-story frame	King st	Dwelling.
" 11...	39	C.K.Aki, Hu See Leong	2-story frame	Rear Hotel st.....	Dwelling.
" 13...	40	Kee Fuck.....	Moved	Queen st	Dwelling.
" 15...	41	O. R. & L. Co	Coaling station.....	O. R. & Co's wharf...	Coaling Station.
" 20...	42	W. Chung Hoon.....	1-story frame	Kamakela	Dwelling.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

Date.	No.	Owner or Applicant.	Character of Building.	Location.	Purpose of Building.
1892.					
July 20...	43	Lau Hing	2-story frame	Beretania st	Dwelling and stables.
" 21...	44	Antone Lopez.....	1-story frame	McCully st	Dwelling.
" 25...	45	C. K. Ai.....	Repairs	Nuuanu st.....	Dwelling and Store.
" 26...	46	C. Akim.....	Repairs	Nuuanu st.....	Store.
" 27...	47	Lee Ho	1-story frame	Kapuukolo	Dwelling.
" 29...	48	Mrs. W. O. Smith....	2-story frame	Cor. Nuuanu & Hobron Lane.....	Dwelling.
Aug. 2...	49	A. Gomes	1-story frame	Punchbowl st.....	Dwelling.
" 2...	50	E. Lazarus & Sing Kee	Hog House	Iwilei	Hog House.
" 4...	51	A. Petrie	1-story frame	Beretania st	Dwelling.
" 6...	52	Ho Fon	2-story frame	Rear Emma st	Dwelling.
" 9...	53	J. A. Mehrten.....	1-story frame	Off Bert'a & Emma sts.	Dwelling.
" 15...	54	T. Rosewarne	Addition	Beretania st	Dwelling.
" 17...	55	H. W. Lahilahi.....	Addition	Beretania st	Dwelling.
" 17...	56	G. Mizuha....	2-story frame	Smith st	Dwelling.
" 26...	57	Ah Sou	Addition	School st.....	Store.
" 27...	58	Akana	1-story frame	Hotel & Kekaulike sts	Dwelling.
" 29...	59	Kamaka	Moved	Queen & South sts ..	Dwelling.
" 29...	60	Kamaka	Moved	Queen & South sts...	Dwelling.
" 30...	61	Chun Ming.....	1-story frame	Hotel st.....	Dwelling.
Sept. 7...	62	W. G. Irwin & Co ...	Not granted	Merchant st	Carriage House
" 9...	63	Kwong Sam Hing ...	Addition	Nuuanu st.....	Dwelling.
" 14...	64	Catholic Mission	2-story frame	Garden Lane	Dwelling.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

Date.	No.	Owner or Applicant.	Character of Building.	Location.	Purpose of Building.
1892.					
Sept. 19...	65	Kum Lee.....	1-story frame.....	King st.....	Dwelling.
" 20...	66	Wong Yuen Sing....	2-story frame.....	Hotel st.....	Store.
" 20...	67	Wong Yuen Sing....	2-story frame.....	Hotel st.....	Dwelling.
Oct. 3...	68	R. N. Boyd.....	Moved.....	Punchbowl st.....	Dwelling.
" 5...	69	Lee Cheung.....	2-story frame.....	Rear Emma & Bert'a st	Dwelling.
" 12...	70	S. C. Allen.....	Alteration & Addition.	King st.....	Dwelling.
" 19...	71	J. A. Magoon.....	Addition.....	Lunalilo st.....	Dwelling.
" 21...	72	W. G. Irwin & Co ...	1-story brick.....	Bet. Queen & Merchant	Warehouse.
" 27...	73	Kwong Loy.....	Alteration.....	Hotel and Union	Store.
" 27...	74	J. S. Monters.....	1-story frame.....	Miller st.....	Dwelling.
" 28...	75	M. J. Costa.....	1-story frame.....	Lunalilo and Kinau..	Dwelling.
" 31...	76	W. J. Lowrie.....	1-story frame.....	Fort and Beretania ..	Dwelling.
Nov. 7...	77	Ah Lum.....	1-story frame.....	Beretania st.....	Store.
" 7...	78	Amoi.....	2-story frame.....	Kikihale.....	Dwelling.
" 14...	79	Haw. Lodge 21 F. & A.M.	2-story stone.....	Hotel and Alakea....	Masonic Lodge.
" 14...	80	J. R. Holt.....	1-story frame.....	King st.....	Store.
" 14...	81	Lee Kum.....	1-story frame.....	South st.....	Dwelling.
Dec. 1...	82	Goo Kim (Chi. Ch'ch)	Addition.....	Fort st.....	Church.
" 1...	83	C. Spreckels & Co ...	Addition.....	Merchant st.....	Pac. Com. Advertiser.
" 2...	84	Chee Kung Tong....	2-story frame.....	Aala.....	Dwelling.
" 2...	85	E. H. Wolters.....	1-story frame.....	Green and Thurston .	Dwelling.
" 5...	86	Pauahi Bishop Mus'm	2-story stone.....	Kam. School Grounds	Museum.
" 8...	87	Choy Tin.....	1-story frame.....	Montgomery st.....	Store.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

Date.	No.	Owner or Applicant.	Character of Building.	Location.	Purpose of Building.
1892.					
Dec. 22...	88	G. W. Kualoku.....	1-story frame	Palama	Dwelling.
1893.					
Jan. 7...	89	Wong Chee Ku.....	Moved	Emma st	Dwelling.
" 13...	90	Ah Hoy	Iron Shed.....	King st	Shed.
" 14...	91	H. Luning.....	1-story frame	Kamakela	Dwelling.
" 25...	92	Catholic Mission	Shed	Fort st.....	Shed.
" 29...	93	Matasku	2-story frame	Maunakea st.....	Store and Dwelling.
" 31...	94	Ving Fat Co.....	Alteration	King and Bethel sts..	Store and Dwelling.
" 31...	95	G. W. Lincoln.....	Alteration	King st	Store.
" 31...	96	Ahoi	1-story frame	Kamanuwai	Store.
" 31...	97	A. Herbert.....	1-story iron.....	Fort st.....	Store.
Feb. 1...	98	Keong Kee	1-story frame	King st	Store.
" 4...	99	Hon. Iron Works Co .	Alteration and Add'n	Hon. Iron Works prem	Machine Shop.
" 6...	100	G. Pereira.....	1-story frame	Punchbowl slope	Dwelling.
" 6...	101	G. Pereira.....	1-story frame	Punchbowl slope	Dwelling.
" 17...	102	R. M. Fuller.....	Repairs	Fort and Chaplain...	Dwelling.
Mar. 3...	103	Haw. Board.....	School	Quarry st	School.
" 4...	104	Ah Ping Co.....	Alteration	Pauahi st	Store.
" 7...	105	Hoo Hon.....	Moved	Fort st.....	Store.
" 11...	106	J. Cowan	1-story frame	Wilder avenue	Dwelling.
" 15...	107	Harrison Bros.....	Alteration	Fort st.....	Store.
" 16...	108	Wong Kwai.....	Alteration and Add'n	Nuuanu st.....	Store.
" 18...	109	Olabi	Alteration	Merchant st.....	Store.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

DATE.	No.	OWNER OR APPLICANT.	CHARACTER OF BUILDING.	LOCATION.	PURPOSE OF BUILDING.
1893.					
Mar. 27	110	White, Ritman & White	Iron Shop	Queen st	Shop.
" 28	111	Ah Song	Repairs	Waiohinu	Poi Shop.
" 30	112	Ah Chew	Alterations	King st	Dwelling.
April 3	113	Wa Kee	2-story frame	Maunakea st	Dwelling and Store.
" 3	114	Wa Kee	Moved	Maunakea st	Store and Dwelling.
" 3	115	E. A. Jones	2-story stone	Fort st	Office.
" 17	116	Dr, Pratt	1-story frame	Nuuanu and Judd	Dwelling.
" 19	117	F. Tacera	1-story frame	Punchbowl Hill Road	Dwelling.
" 19	118	Tuck Ming	1-story frame	King st	Store.
" 19	119	Tuck Ming	Moved	King st	Dwelling.
" 20	120	Ahi	1-story frame	Nuuanu st	Dwelling.
" 20	121	Homau	Frame	Waikahalulu	Dwelling and Store.
" 20	122	Yow Choi	1-story frame	Pauoa Road	Poi Shop.
" 21	123	A. Inario	1-story frame	Beretania st	Dwelling.
" 22	124	Kim Lun Kee	1-story frame	Pauoa Road	Dwelling.
" 24	125	G. V. Moreria	1-story frame	Honuakaha	Dwelling.
" 25	126	E. S. Holt	Repairs	Nuuanu st	Store.
" 25	127	E. S. Cunha	2-story brick	Maunakea st	Store.
" 25	128	Julia A Paty	2-story frame	Nuuanu avenue	Dwelling.
" 26	129	Ani	1-story frame	Kapalama	Store.
" 28	130	A. August	1-story frame	Punchbowl st	Dwelling.
" 29	131	Leong Choi	1-story frame	Waikahalulu	Dwelling.
May 1	132	H. C. Reid	Addition	Kinau st	Dwelling.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

DATE.	No.	OWNER OR APPLICANT.	CHARACTER OF BUILDING.	LOCATION.	PURPOSE OF BUILDING.
1893.					
May 2...	133	R. Catton	1-story frame	Rear Catton's wareh'se Queen st	Office.
" 2...	134	Mr. Halstein.....	Addition	Kinau st	Dwelling.
" 4...	135	S. Kanahele	1-story frame	Kauluwela.....	Dwelling.
" 5...	136	J. Powell.....	Moved	Punchbowl st	Dwelling.
" 6...	137	S. K. Kane	1-story frame	School st.....	Dwelling.
" 9...	138	Ahi.....	Iron addition	Nuuanu st.....	Store.
" 11...	139	G. Schuman	1-story frame	South st.....	Dwelling.
" 15...	140	Hon. Iron Works Co..	Alteration and Add'n.	Hon. Iron Works prem	Shop.
" 15...	141	J. Q. Baptista	Stable	Punchbowl st	Stable & wash-house.
" 16...	142	Chin Wo Co	1-story frame	Beretania st.....	———
" 16...	143	L. Ahlo	Repairs	Nuuanu st.....	Store.
" 17...	144	E. H. Wodehouse....	1-story frame	King st	Dwelling.
" 31...	145	G. Mizuha.....	1-story frame	Pauahi st.....	Cook-house.
" 31...	146	J. W. Podmore.....	1-story frame	Emma st	Dwelling.
June 6...	147	E. C. Winston.....	1-story frame	Hotel st.....	———
" 10...	148	W. Ahana	Repairs	Pauahi and Smith sts.	———
" 16...	149	C. Wall	1-story frame	Kapiolani st	Dwelling.
" 20...	150	Lee Kang See.....	Repairs	Beretania st	Store.
" 20...	151	Jun Hee.....	Repairs and addition.	Union and Hotel sts..	Store.
" 21...	152	Quong Chong	Repairs and addition.	Hotel st.....	Store.
" 23...	153	M. C. Jesus.....	Moved	South st.....	Dwelling.
" 24...	154	J. K. Kahina.....	1-story frame	Pauoa	Dwelling.

" 24 . . . 1544 J. K. Kahina . . . . . 1-story frame . . . .

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

DATE.	No.	OWNER OR OCCUPANT.	CHARACTER OF BUILDING.	LOCATION.	PURPOSE OF BUILDING.
1893.					
June 30 . . .	155	Sailor's Home	2-story brick	Halekauwila & Alakea	Home.
July 10 . . .	156	A. K. Palekaluhi	2-story frame	Kahuwela	Store and dwelling.
" 12 . . .	157	E. C. Winston	1-story frame	King st	Dwelling.
" 12 . . .	158	G. N. Wilcox	Addition	King st	Dwelling.
" 14 . . .	159	Queen's Hospital	2-story brick	Queen's Hospital	Hospital.
" 25 . . .	160	Chu Tin	Frame	Kikihale	Dwelling.
" 25 . . .	161	Ordway & Porter	Iron shed	Rear store Hotel st . .	Work shop.
" 26 . . .	162	J. de Mota	1-story frame	Kinau st	Dwelling.
Aug. 1 . . .	163	M. Reis	Shed	Queen st	Carriage shed.
" 11 . . .	164	Y Ah Lock	2-story frame	South st	Dwelling and store.
" 15 . . .	165	Haw. Elec. Light Co. .	Brick	Halekauwila & Alakea	Electric Light Works.
" 15 . . .	166	Wun Shing	Lanai	King st	Lanai.
" 30 . . .	167	Kaluna	1-story frame	Iwilei	Dwelling.
" 30 . . .	168	L. Perkins	1-story frame	Near St. Louis College	Dwelling.
" 30 . . .	169	L. Perkins	1-story frame	Near St Louis College	Dwelling.
" 30 . . .	170	L. Perkins	1-story frame	Near St. Louis College	Dwelling.
" 30 . .	171	L. Perkins	1-story frame	Near St. Louis College	Dwelling.
" 30 . . .	172	J. Silva	1-story frame	Punchbowl Road	Dwelling.
" 30 . . .	173	H. Davis	Iron shed	Rear 505 Fort st	Shed.
Sept. 7 . . .	174	J. K. Kaulia	1-story frame	King and Halepupule	Dwelling.
" 14 . . .	175	Ho Hon	Shed	Maunakea st	Shed.
" 17 . . .	176	J. A. Sing	1-story frame	Banana pl'n, Nuuanu	Dwelling.
" 26 . . .	177	J. Barbora	1-story frame	Alapai st	Dwelling.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

DATE.	No.	OWNER OR OCCUPANT.	CHARACTER OF BUILDING.	LOCATION.	PURPOSE OF BUILDING.
1893.					
Sept. 29...	178	Pak Foo	Moved and addition..	Maunakea near Queen	Dwelling and store.
Aug. 31...	179	W. Larsen.....	Addition	School st.....	Dwelling.
Sept. 29...	180	C. Johnson	2-story frame	Prospect & Kapiolani.	Dwelling.
Oct. 4...	181	E. Silva	1-story frame	Miller st.....	Dwelling.
" 6...	182	L. Aseu	Addition	Nuuanu and King ...	———
" 11...	183	V. de Freitas	1-story frame	Punchbowl Hill Road	Dwelling.
" 21...	184	Malia	1-story frame	Queen st	Dwelling.
" 23...	185	J. Ahin.....	1-story frame	Nuuanu b'l'w Vineyard	Dwelling.
" 23...	186	A. Cabral.....	1-story frame	Kinau st	Dwelling.
" 24...	187	Ah Sun	Alteration	Maunakea st.....	Dwelling.
" 26...	188	Fook Wo.....	2-story frame	Nuuanu st.....	Store.
" 26...	189	C. Klemme	1-story frame	Wilder avenue	Dwelling.
Nov. 13...	190	C. Grasia.....	1-story frame	Punchbowl st	Store.
" 13...	191	F. Freitas	1-story frame	Punchbowl st	Dwelling.
" 13...	192	Yee Chong	Alteration	King and Kaulike sts	Store.
" 17...	193	I. I. S. N. Co.....	2-story Iron	Kilauea st	Shed.
" 20...	194	Lewis & Co.....	1-story Iron	Rear Lewis & Co. Fort	Store-house.
" 21...	195	N. F. Burgess.....	Iron shed.....	King st	Shed.
" 22...	196	J. A. Victor.....	Iron shed.....	Hotel st.....	Merry-go-round build
" 29...	197	J. J. Sullivan	Repairs	Fort st.....	Stables.
Dec. 4...	198	J. M. Kea	1-story frame	Quarry st.....	Dwelling.
" 4...	199	J. Kintal	1-story frame	Kinau st	Dwelling.
" 4...	200	J. Kintal	1-story frame	Kinau st	Dwelling.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

DATE.	No.	OWNER OR OCCUPANT.	CHARACTER OF BUILDING.	LOCATION.	PURPOSE OF BUILDING.
1893.					
Dec. 4...	201	S. Souza.....	1-story frame	Punchbowl Hill Road	Dwelling.
" 6...	202	Sin Sang	Addition	King and Punchbowl.	Store.
" 6...	203	Fook Kee	Addition	Beretania st	Store.
" 6...	204	F. Silva	1-story frame	Punchbowl st.....	Dwelling.
" 6...	205	B. J. Ignacio.....	1-story frame	Punchbowl st..	Dwelling.
" 11...	206	J. de Freitas.....	1-story frame	Punchbowl st.....	Dwelling.
" 27...	207	A. J. Cartwright.....	Repairs	Union st	Dwelling.
1894.					
Jan. 4...	208	G. N. Wilcox.....	Repairs	Queen st	Dwelling.
" 4...	209	M. Fernandez.....	1-story frame	Quarry st	Dwelling.
" 9...	210	A. Girdee	1-story frame	Quarry st	Dwelling.
" 11...	211	Harrison Bros.....	2-story stone.....	Kekuanaoa st	Store.
" 18...	212	J. de Mello	1-story frame	Quarry st	Store.
" 18...	213	C. A. Peacock	1-story frame	Lunalilo & Keaumoku	Store.
" 19...	214	Geo. Turner	1-story frame	Fort and Beretania sts	Store.
" 19...	215	Jun Hee	Iron addition	King and Alakea sts .	Store.
" 19...	216	G. Holowale	1-story frame	Kukuluaeo	Store.
" 20...	217	F. J. Testa	Moved and repairs...	Liliha st	Store.
" 23...	218	J. Rodriques.....	1-story frame	Kunuiakea lane	Store.
Feb. 3...	219	J. Cordeiro	1-story frame	Punchbowl road.....	Store.
" 6...	220	P. High.....	Shed.....	Enterprise Mill.....	Shed.
" 9 ..	221	G. Cavanagh.....	Alteration	King st	Office.
" 10...	222	Bill Kolii.....	Moved	Liliha st	Dwelling.

BUILDING PERMITS ISSUED APRIL 1st, 1892, TO MARCH 31st, 1894.—Continued.

Date.	No.	Owner or Occupant.	Character of Building.	Location.	Purpose of Building.
1894.					
Feb. 14...	223	J. Marcus	1-story frame	Punchbowl road.....	Dwelling.
" 7...	224	A. Cantolaede... ...	1-story frame	School st.....	Dwelling.
" 15...	225	M. S. Pereira	1-story frame	School st,.....	Dwelling,
" 21...	226	L. H. Dee	Repairs and addition.	Fort st.....	———
" 21...	227	J. B. Connell.....	1-story frame	Beretania st	Dwelling.
" 23...	228	J. A. Victor.....	Iron addition	Bethel st	Office.
" 26...	229	Joo Sen	Addition	Pauahi st.....	Store.
Mar. 9...	230	F. W. Damon	Addition	Chaplain st	Dwelling,
" 9...	231	J. Kintal	1-story frame	Punchbowl road.....	Dwelling,
" 12.	232	M. B. Silveria.....	Repairs	Nuuanu & Fowler's y'd	Store.
" 19...	233	M. E. Silva	1-story frame	Aala	Dwelling,
" 19...	234	V. de Freitas	1-story frame	Punchbowl st.....	Dwelling.
" 21...	235	P. Davies.....	1-story frame	Liliha st	Dwelling.

GOVERNMENT REALIZATIONS.

The amounts returned by this Bureau are as follows:

132 building permits after March 3rd, 1893.....	$	660 00
Use of scows, etc., by "Miowera".....		245 00
" New Market by Electric Co.....		30 00
Sale of old material.....		904 00
Cash on pay rolls not called for.....		4 53
Total.....	$	1,843 53

RECOMMENDATIONS.

NEW WHARVES.

The dredging of the bar has already increased the number of deep draught vessels coming into the harbor, and the necessity for wharf accommodation for the larger class of vessels becomes more urgent.

Instead of the wharves 300 feet long recommended in the report of 1890, it will be advisable to make an excavation 150 feet wide, extending back 440 feet from the face line of the Pacific Mail wharf. On one side of this excavation build a wharf 440x100 feet, and on the other 400x60 feet, The excavation can doubtless be done with the new dredger, and the cost of the whole improvement will be $90,000.00.

Besides this an appropriation of $28,000.00 will be required to complete the wharves already begun at the upper end of the harbor, and to build the retaining wall where the debris from the excavation and harbor dredging will be deposited.

It is also important to look forward to large improvements in the future in the upper part of the harbor. If the Government can secure the necessary property adjoining the harbor frontage, between the fish market and the O. R. & L Co's.

wharf, accommodations for large vessels can be made on that side which will be desirable, on account of being so near the business portion of town, as well as having close connection with the railroad.

A portion of the required property has already been secured, and it is to be hoped the Government will succeed in getting the rest.

NEW WHARF, HILO.

I will again urge the importance of building a wharf on the Waiakea side of Hilo bay, which will accommodate the important and increasing traffic of that port. Outside of Honolulu the harbors where ship wharves can be built are so few, that advantage should be taken of every such location where the business will warrant.

BOAT WHARF, NAPOOPOO.

The expenditure of $600.00 at this place will greatly facilitate the handling of the large amount of freight shipped, and will be money well spent.

BOAT WHARF, KAUNAKAKAI.

The filling in at Kaunakakai has made the handling of freight very tedious.

The shallow water extends so far that it will require a wharf 1,300 feet long. A narrow wooden roadway on concrete pillars leading to a pier head, large enough to accommodate two boats, can probably be built for $2,000.00.

BUOYS, PUULOA.

A couple of buoys on the bar at the entrance to Pearl harbor, would often be of great assistance to the numbers of small craft going in and out. The expense will not be large, and can be met from the appropriation for landings and buoys, Oahu.

LIGHT HOUSES.

The Honolulu harbor light is so low down and so weak that it gives very unsatisfactory service. A fixed light among so many ship and shore lights, is not easily picked up on a hazy night, and the change to a red light diminishes the power very much, so I should advise a flash light set at least twenty feet higher. This can be done for $12,000.00.

DIAMOND HEAD.

A light on Diamond Head, visible within a radius of eighteen miles, could be made to show a red sector within a certain distance of the coast. Such a light would be a very important assistance to steamers coming from the south and west, and would also be desirable for vessels approaching from the windward. $9,000.00 is asked for this purpose.

KOHALA AND NAWILIWILI.

A light at each of these places will be a great help to inter-island vessels on these routes, and $1,300.00 will be sufficient for both.

NEW BUILDINGS.

CENTRAL FIRE STATION.

Engine House No. 2 is in a very bad condition, and should be abandoned or rebuilt as soon as practicable.

A new central station built as planned of native stone would give the accommodation required, and would be a lasting ornament to the city of Honolulu. If the expense of this makes it impracticable, a cheaper house should be built or extensive repairs made to No. 2 Engine House.

NEW WASH HOUSES.

The wash houses destroyed by fire have not been replaced and the condition of those still in use, make a thorough renovating necessary.

The present location is central, and with proper arrangements for drainage, new wash houses can be built on the same site, which will neither be offensive to the eye nor a menace to public health. I think $10,000.00 will be sufficient for this.

NEW MARKET.

With so fine a building available it is very objectionable that the old market should continued to be occupied any longer than absolutely necessary to fit up the new one.

To complete a permanent concrete or granite block floor over the whole building will be a very expensive job, but the central portion of the building can be fitted up with a substantial wooden floor and stalls, which will be good for eight or ten years for about $5,000.00, and would make it possible to abandon the old site.

NEW VAULTS.

A contract has been made with the Diebold Safe and Lock Co. for a steel vault lining with automatic time Lock for the Treasury Department. This will be furnished and set up for $2,350.00.

The brick work is to be finished by the Government, and will probably be let out by contract.

A fireproof vault is also needed in the Survey Department. $7,000.00 are asked to complete these vaults.

COURT HOUSE, HONOKAA.

The Honokaa district has become populous, and the old building is quite inadequate for court purposes.

A building the size of the North Kohala Court House will be suitable, and will require an appropriation of $3,500.00,

COURT HOUSE, WAIOHINU.

The same necessity exists in Kau district, and a like amount is asked for that.

JAILER'S HOUSE, N. KOHALA.

Since the building of the new Court House no provision has been made for a jailer's house. $1,200.00 should be ample for the purpose.

JAIL, HILO.

In 1890 the Hilo jail was reported so old and decayed that a new one was necessary. Until now the same jail has been made to serve by making repairs, but it has at last become quite unsafe, and a new one containing sixteen cells should be built as soon as practicable.

It is estimated that $3,500.00 will cover the cost.

If that amount is not available, somewhat extensive repairs made judiciously, will make the building safe for another two years.

NEW ROADS.

The developments along the line of the Volcano road shows plainly that nothing is so important a necessity on the Island of Hawaii as good wagon roads. The prison gang should be kept constantly employed on this work. The road from Hilo to the Volcano will be completed about the end of July. Then if the rains are sufficient to insure a supply of water on the Kau side, the work should be continued from the Volcano house towards Kapapala, at least across the lava flows seven miles from the Volcano house.

When that is done, or if dry weather makes it impracticable, the prisoners should be put on to the new road through Puna, which has been surveyed.

KAU.

The new road from Hilea and Pahala requires top dressing and a new grade at the Pahala end. This should be completed in a thorough manner, as it is the connecting link between two important sections of the district.

KONA.

The two Konas should have a fair share of new road made during the period. The Kohanaiki road from Kailua should be completed, and the worst portions of the upper road in both districts regraded and reconstructed.

MAKENA TO KULA.

On Maui the large amount of produce raised in Kula and shipped at Makena, makes the construction of the road laid out by Mr. Bruner very desirable.

PALI ROAD.

On Oahu the large amount of traffic between Koolau and Honolulu demands the completion of the Pali road. $35,000.00 would probably accomplish it.

RESERVOIRS.

It is not out of place to urge the importance of increasing the water storage capacity in Nuuanu valley.

Even though a pumping plant is erected to supply the needs of consumers in the city, increased storage will be profitable for power at the Electric Light Station, and all the water that can be saved from running to waste in the storms will be in demand for irrigation, if not needed for household purposes.

The largest storage capacity in proportion to the cost will be obtained by building the large reservoir in upper Nuuanu,

which has been surveyed and repeatedly recommended; but if funds for so large an undertaking are not available, it will pay to increase the size of No. 3, and also No. 2 reservoirs.

WAILUKU WATER WORKS.

An effort should be made to secure a water right, and the pipes which were received four years ago should be laid. An appropriation of $15,000.00 will be required for this.

TRAVELING EXPENSES.

I would ask that an amount of $500.00 be included with the incidentals of this Bureau to provide for traveling expenses.

The attempt has been made to charge such expenses in each case to the appropriation covering the work designed to be examined on the trip, but it often happens that a number of objects are included in the same trip, and the expense must arbitrarily be charged to one of them, or else divided up, with the necessity for separate vouchers for each portion. It would seem proper to have such expenses charged to one appropriation.

Respectfully submitted,

W. E. ROWELL,

Superintendent of Public Works.

BIENNIAL REPORT

OF THE

MINISTER OF THE INTERIOR.

DEPARTMENT OF THE INTERIOR,
March 31st. 1894.

TO THE PRESIDENT AND MEMBERS
OF THE EXECUTIVE AND ADVISORY COUNCILS:

I have the honor to submit herewith a Report of the receipts, disbursements and other transactions of the Interior Department, together with detailed reports from the Chiefs of its various Bureaus for the biennial fiscal period ending the above date.

The appropriations for the Interior Department passed by the Legislative Assembly of 1892, were under two Sections, viz:

Sec. 1.	From current receipts...	$880,447 29	
	Supplementary Act of Jan. 12th, 1893, Roads and Bridges, Honolulu	35,000 00	
			$ 915,447 29
Sec. 2.	From Loan Funds.....		967,128 20
			$1,882,575 49

In addition to the above, the following special appropriations under this Department were made during the period, by the Provisional Government.

Act 56.	Running expenses Water Works	$ 3,000 00	
	Public Grounds	1,300 00	
Act 59.	Jail at Kohala, Hawaii	2,000 00	
	Jail, Hamakua, Hawaii	2,000 00	
Act 61.	Honolulu Fire Department	2,600 00	
	Running expenses Insane Asylum	6,000 00	
	Honolulu roads	4,000 00	
	General expenses Board of Health	500 00	
	Claim of Irene H. Brown (return water rates)	151 37	
			21,551 37
			$1,904,126 86

The disbursements are as follows:

Section 1	$767,501 38	
Supplementary Act, Jan. 12, 1893	35,000 00	
Section 2	276,899 59	
Special	19,861 48	
		1,099,262 45
Appropriation balance Mar. 31, 1894		$ 804,864 41

In addition to the above, the special deposit of road taxes, which are credited to and can only be used for the road purposes of the districts where collected, amounted to.....	$	190,629 32
Disbursements for the period.....		161,136 23
Leaving a credit balance of this special deposit, March 31st, 1894, of.....	$	29,493 09

which is available for road purposes of the new period.

DEPARTMENT RECEIPTS.

The revenue of this Department is derived from license fees, sales and leases of Government lands, water rates, registry of conveyances, electric lights and sundry fees and realizations, which for the biennial fiscal period just closed amounted to $512,903.22.

Details of these receipts in a comparative table with those of the previous period are here given.

INTERIOR DEPARTMENT RECEIPTS FOR PERIOD ENDING MARCH 31, 1894, AS COMPARED WITH THE RECEIPTS FOR THE PREVIOUS FISCAL PERIOD.

RECEIPTS AT CLERK'S OFFICE.	Two years ending Mch 31, 1892.	Two years ending Mch 31, 1894.	Increase.	Decrease.
LICENSES—				
Agents	$ 750 00			750 00
Alcohol	400 00	$ 400 00		
Auction & tax	4,164 53	3,261 30		903 23
Awa	11,673 95	9,320 55		2,353 40
Banking	2,000 00	2,000 00		
Billiard	875 00	825 00		50 00
Boat	184 00	280 00	96 00	
Boatman		73 00	73 00	
Butcher	3,480 00	3,580 00	100 00	
Dray	477 50	370 00		107 50
Driver	830 00	717 00		113 00
Drug	320 00	320 00		
Fire-arms	465 00	440 00		25 00
Hack	1,739 00	1,649 00		90 00
Horse	10 00	10 00		
Live stock	500 00			500 00
Livery stable	300 00	350 00	50 00	
Lodging house	216 00	346 00	130 00	
Milk	200 00	650 00	450 00	
*Peddling	3,100 00	1,950 00		1,150 00
Peddling, cake	1,600 00	1,850 00	250 00	
Physician	170 00	210 00	40 00	
" Chinese	30 00			30 00
Pork butcher	1,920 00	2,140 00	220 00	
Public show	3,865 00	3,565 00		300 00
Salmon	720 00	610 00		110 00
Shipping	200 00			200 00
Spirit—wholesale	$ 11,000 00	10,000 00		1,000 00
" Dealers	6,000 00	6,500 00	500 00	
" Retail	34,416 67	36,000 00	1,583 33	
Victualing	15,700 00	16,450 00	750 00	
†Retail	72,200 00	27,900 00		
Wholesale	17,350 00	6,850 00	4,650 00	
Merchandise		59,450 00		
Rents	111,073 27	123,198 89	12,125 62	

INTERIOR DEPARTMENT RECEIPTS.—Continued.

RECEIPTS AT CLERK'S OFFICE.	Two years ending Mch 31, 1892.	Two years ending Mch 31, 1894.	Increase.	Decrease.
Naturalization..	$ 580 00	$ 1,100 00	$ 520 00	....
Govt. realization	9,494 22	14,193 54	4,699 32	....
Laws—sales of .	204 00	156 50	....	$ 47 50
Land office, fees.	650 00	640 00	....	10 00
Land, sales	62,155 65	31,176 48	....	30,979 17
" interest..	1,011 57	2,099 87	1,088 30	....
Homesteads....	4,100 19	8,906 53	4,806 34	....
" interest	3,821 75	4,448 26	626 51	....
Commutation ..	685 41	....	....	685 41
	$390,632 71	$383,986 92	$ 32,758 42	$ 39,404 21
RECEIPTS OF VARIOUS BUREAUS.				
Electric light ..	9,556 40	8,010 90	....	1,545 50
Honolulu m'rket	13,295 85	16,590 85	3,295 00	....
Waterworks—				
Honolulu.	84,580 55	85,017 50	436 95	....
Hilo	1,326 16	3,168 05	1,841 89	....
Koloa....	....	145 00	145 00	....
Registry of Conveyances...	18,051 75	15,984 00	....	2,067 75
	$517,443 42	$512,903 22	$ 38,477 26	$ 43,017 46
‡Post-office	38,092 65	....	....	....
§Prison	5,470 14	....	....	....
	$561,006 21	$512,903 22	....	....

* Peddling license Act repealed by Act 47 of the Provisional Government.

† The classes Retail and Wholesale, were merged into Merchandise License by the Act of December 19, 1892.

‡ Bureau of Post Office was transferred to the Finance Department by Act of November 14, 1890.

§ Bureau of Prisons was transferred to the Attorney-General's Department by Act of July 16, 1890.

The comparative statement of receipts, aside from the decrease caused by the transfers of the Postal Bureau and the care of prisoners to other Departments, shows a falling off in the grand total of $4,540.20 for the two years. But noting the fact that a large item of decrease (nearly $31,000) was in sales of Government lands, it will be seen that the showing is a very satisfactory one, and the total receipts are in excess of the estimates.

AWA.

A steady and rapid decline in the receipts from awa license fees is shown by a comparison of the returns for a few years past.

The use of this drug or medicinal root has been confined chiefly to the native Hawaiians, although it has been exported to some extent for medical purposes.

By a joint resolution of the Legislative Council passed in August, 1846, restrictions were placed on the planting and use of awa. Licenses were authorized for the planting of one field, not to exceed six acres in size on each of the Islands of Hawaii, Maui, Oahu and Kauai. Licenses were also authorized for the sale of awa, but the awa could only be sold to applicants producing a certificate from a duly authorized physician, "that the same was to be used as a medicine." No license fee was named in this act or resolution.

The first reference to receipts from this source appears in the report of the Minister of Finance for the two years ending March 31st, 1860, and the amount, $250.00. The license fee (Sec. 87, Civil Code, 1859) was placed at $50.00, and the number of licenses was not limited.

The licensee was required to give bonds in the sum of two hundred dollars, to sell (except for export) for medicinal purposes only, and upon certificate from a duly licensed physi-

cian. Any person found using awa except as duly prescribed medicine, was subject to a fine of five dollars.

The receipts for the period ending March 31st, 1862, amounted to..... $412 75
For the two years ending March 31st, 1864..... 850 00

Under the Act of January 10th, 1865, the licenses were limited, and the fees increased as follows:

Honolulu,	3	Licenses at.....	$500 00	each.
Lahaina,	2	" "	300 00	"
Hilo,	2	" "	300 00	"

all other Districts 1 license each, at $100.00.

In event of the applications exceeding the limit of licenses allowed in any one district the privilege was sold at auction.

This Act caused competition, and the result was a large and continued increase in receipts from these fees as the following statement will show:

Two years to March 31st,		1866.....	$ 5,104 60
"	"	" 1868.....	10,774 88
"	"	" 1870.....	11,888 97

By the Act of July 18, 1870, the fee for Wailuku was increased to $300.00, and the number of licenses for that district increased to two.

The receipts following, were:

Two years to March 31st,		1872.....	$ 8,265 15
"	"	" 1874.....	9,535 37
"	"	" 1876.....	7,650 05
"	"	" 1878.....	19,289 75
"	"	" 1880.....	14,135 75
"	"	" 1882.....	19,167 87

When the Spirit License Act of August, 1882, removed the restriction upon the sale of spirits to native Hawaiians, it

was supposed that the awa business would decrease; but on the contrary, the competition for licenses was such that the license fees for the two years ending March 31st, 1884, amounted to $20,335 50; and for the ensuing two years ending March 31st, 1886, reached the highest notch, $21,758.25.

Since then the receipts have been as follows:

Two years ending March 31st, 1888	$19,694 50
" " " " 1890	18,628 10
" " " " 1892	11,673 95
And for the fiscal period just closed	9,320 55

which is the lowest amount received from this source since the period ending March 31st, 1876.

BOATMAN'S LICENSE.

This class of license was instituted under Act 20, approved March 2nd, 1893, and consequently has been in operation one year. It is intended as a check to irresponsible parties plying boats for hire, and is of material assistance to the police for purposes of identification, in case of any breach of the laws by boats plying in the harbor of Honolulu.

The license fee is nominal ($1.00), and the system has thus far worked well.

MILK LICENSE.

The "Act to provide for licensing Dairies and the Sale of Milk and for the Inspection of Milk in the City of Honolulu," was passed by the Legislature of 1882.

The Act itself calls for a license for the sale of milk only, and Section 5 reads: "The provisions of this Act shall not be held to apply to persons keeping a cow or cows for private use, who may dispose of surplus milk to neighbors, not offering the same at public sale."

Section 4, relating to the inspection of milk is an excellent provision, and should be strictly enforced.

But in view of the clause of Section 5, relating to persons keeping a cow or cows and disposing of surplus milk: I respectfully submit that all sales of milk should be equally licensed at a reasonable fee, or, that considered in the light of a home product and a necessity, the same as the supplying of bread, the license fee should be abolished.

In event of the repeal of this Act, a regulation under the sanitary code of the Board of Health, would provide for a regular system of milk inspection.

LIVE STOCK LICENSE.

Under Act 65, of the Session Laws of 1890, providing for the importation and sale of live stock, two licenses were issued for the period ending March 31st, 1892, but none during the last period.

This law requires that "All dealers in live stock, bringing live stock into the country for sale, by order, or by importation for gain, such as horses, mules, jacks, cattle, sheep and hogs, shall before any of such live stock can be offered for sale or sold," obtain a license from the Minister of the Interior and pay a license fee of two hundred and fifty dollars, such license being good for one year.

The Act names no penalty, and there is no limit of time to prevent a person from importing live stock for his own use, and after a very brief holding disposing of the same.

If the law was intended to protect stock raisers and at the same time be a source of revenue to the Government, it should be amended, otherwise it should be repealed.

HACK LICENSE IN WAILUKU AND HILO.

The Legislature of 1892, passed "An Act to regulate the carrying of passengers for hire in carriages, wagons and other vehicles, in the Districts of Wailuku and Hilo." Under this

Act the vehicles and harness are subject to inspection, and the drivers are certified in a manner similar to those of Honolulu; and under the authority vested in the Minister of the Interior by this Act, rules and regulations and a schedule of "rates of fare" have been issued, to be observed by licensed carriers and drivers in those districts.

Under this Act 16 licenses are now held in the District of Wailuku and 5 in Hilo.

MERCHANDISE LICENSE.

The Act to amend the law relating to goods, wares and merchandise, substituting the words "merchandise license" in lieu of the former wholesale and retail classes of license, went into effect in January, 1893.

Under the new law the schedule of fees is based upon the amount of sales, and the application for license is required to contain a sworn statement of the total amount of sales of merchandise for the past year.

The schedule as fixed by law is as follows:

ANNUAL SALES.	ANNUAL FEE.
$600,000 00 and over	$1,000 00
400,000 00 and less than $600,000 00	850 00
200,000 00 and less than 400,000 00	700 00
100,000 00 and less than 200,000 00	550 00
80,000 00 and less than 100,000 00	400 00
60,000 00 and less than 80,000 00	250 00
40,000 00 and less than 60,000 00	125 00
20,000 00 and less than 40,000 00	75 00
Under $20,000 00 per annum	50 00

The following comparative statement of receipts for the first twelve months will fairly illustrate the working of the new law, as a matter of revenue:

MERCHANDISE LICENSE RECEIPTS FOR 1893, AS COMPARED WITH WHOLESALE AND RETAIL LICENSE RECEIPTS FOR 1892.

Month.	1892.			1893.
	Wholesale.	Retail.	Total.	Merchandise
January	.....	$ 3,950 00	$ 3,950 00	$ 2,275 00
February	$ 1,200 00	3,450 00	4,650 00	3,675 00
March	200 00	1,750 00	1,950 00	3,825 00
April	1,250 00	3,450 00	4,700 00	4,325 00
May	.....	3,550 00	3,550 00	3,750 00
June	1,000 00	3,000 00	4,000 00	4,350 00
July	1,800 00	3,050 00	4,850 00	5,225 00
August	500 00	2,900 00	3,400 00	4,800 00
September	600 00	2,100 00	2,700 00	2,625 00
October	350 00	2,650 00	3,000 00	4,350 00
November	550 00	3,350 00	3,900 00	3,650 00
December	400 00	2,400 00	2,800 00	4,150 00
	.....	.....	$ 43,450 00	$ 47,000 00

In this connection the following table compiled for the year ending March 31st, 1894, and showing the classes and number of the more important licenses issued by this Department and the nationality of the licensees, will prove of interest.

Nationality.	Merchandise.	Beef butcher.	Pork butcher.	Cake peddling.	Hack.	Dray.	Driver.	Lodging-house.	Milk.	Victualing.	Spirit.		
											Wholesale.	Dealers.	Retail.
Chinese	447	14	48	28	63	13	86	37	..	132	4	..	1
Japanese	81	1	..	12	1	3	6	11	..	27	1	..	..
Portuguese	40	7	2	..	14	4	41	..	12	1	1	..	2
All other	169	59	4	..	92	54	255	44	9	13	4	7	15
	737	81	54	40	170	74	388	92	21	173	10	7	18

DETAILED STATEMENT OF GOVERNMENT REALIZATIONS.

RECEIPTS OF INTERIOR DEPARTMENT.

FEES—Brands, Registry of		$	451 00
Building Permits			1,010 00
Candidates—			
For Nobles	$400 00		
Representatives	175 00		
			575 00
Certificates, verifying documents			35 50
Certificates, in re publishing of newspapers			23 50
Charters, Recording of			166 70
Dis-incorporation			30 00
Patents of Invention, Caveats Copyrights, Labels and Trade Marks			261 50
Permission to Assign, Transfer and Mortgage Government Lease			85 00
Registry of Copartnership			76 50
Registry of Women trading in their own name			3 00
SALES—Animals, Government, Condemned			123 00
Buildings, lumber and firewood, old			745 15
Cemetery Lots, Makiki			90 50
Electrical supplies			1,800 00
Manure, soil, sand, coral, etc			3,843 32

Sundry old material.....$	995 79	
SUNDRY—Benefits, street widening.	115 19	
Government Survey, sale of Maps, etc.....	86 00	
Gunpowder Storage	592 80	
Insane Asylum (pay patients).....	1,016 00	
Pounds, Government (unclaimed balances).....	32 80	
Royalty on Guano taken from Pacific Islands...	1,268 29	
Ferry, Government (receipts from).....	484 30	
Steam Roller, carts, prison labor, etc., hire of.....	439 20	
		14,350 04

ESTIMATED RECEIPTS OF THE INTERIOR DEPARTMENT FOR THE FISCAL PERIOD TO END MARCH 31ST, 1896.

LICENSES—Agent (traveling).....	500 00	
Alcohol.....	400 00	
Auction and Tax.....	3,500 00	
Awa	9,500 00	
Banking.....	2,000 00	
Billiard and Bowling ...	850 00	
Boat.....	275 00	
Boatman.....	70 00	
Butcher.....	3,500 00	
Cake Peddling.....	1,800 00	
Dray.....	370 00	
Driver	725 00	

Drug	$ 320 00	
Fire Arms	400 00	
Hack	1,600 00	
Live Stock	500 00	
Livery Stable	300 00	
Lodging and Tenement	350 00	
Merchandise	94,000 00	
Milk	600 00	
Physician	150 00	
Physician, Chinese	20 00	
Pork Butcher	2,000 00	
Public Show	3,500 00	
Salmon	620 00	
Shipping	100 00	
Spirit, Wholesale	10,000 00	
" Dealers	6,500 00	
" Retail	36,000 00	
Victualing	16,000 00	
		$196,450 00
RENTS		115,000 00
LAND OFFICE—Fees	$ 600 00	
Land Sales	35,000 00	
Interest ditto	1,500 00	
Commutation	100 00	
Homestead Sales	7,000 00	
Interest ditto	4,000 00	
		48,200 00
Laws, Sale of		200 00
Government Realizations, Sundry		10,000 00
Naturalization Fees		1,000 00
		$370,850 00

ESTIMATED RECEIPTS OF VARIOUS BUREAUS.

Honolulu Water Works	$ 95,000 00	
Honolulu Electric Lights	6,000 00	
Honolulu Markets	13,000 00	
Registry of Conveyances	16,000 00	
Hilo Water Works	3,000 00	
Koloa Water Works	150 00	133,150 00
		$504,000 00

GOVERNMENT LANDS.

During the biennial period just closed, 43 sales of Government lands have been held, and 40 new leases made, the leases representing an annual rental of $18,588.12.

The applications for lands adapted for coffee culture and for other agricultural pursuits have been numerous, and in order that the Government should be able to supply this demand, it was decided to limit the acreage for sale to 50 acres and for lease to 100 acres. The length of the term for lease being fixed not to exceed 15 years.

On account of the numerous applications and the limited acreage of land suitable for these purposes, the Government has been considering the feasibility of a new system of disposing of Government lands, by having tracts surveyed and plotted out into lots suitable for small holdings, and under terms and conditions that will encourage persons of small means to purchase homes, at the same time making certain restrictions to prevent parties bidding off more than one lot, and holding them for speculating purposes.

As an experiment, the Government has had 23 lots laid out on the Government land of Kaumana, District of Hilo, Hawaii, with the intention of placing them in the market, under

the following terms and conditions, which it is hoped will accomplish the object desired.

Terms and Conditions.

No person will be allowed to purchase more than one lot.

The terms of the sale are cash, or at the option of the purchaser, one-fourth of the purchase price cash, and the remainder in equal installments in one, two and three years, with interest payable semi-annually at the rate of seven (7) per cent. per annum.

Each purchaser shall begin substantial cultivation and improvement of his lot during the first year, and shall continue such cultivation through the succeeding two years.

At the end of the third year, if all conditions have been performed by purchaser, he shall receive Patent, conferring fee simple title.

Failure to perform the above conditions shall work forfeiture of interest in the land.

In case of forfeiture, land to be sold at auction by the Government, and if such sale result in an advance on the original price, the original purchaser to receive therefrom the amount of his payments to the Government on account of purchase without interest, and a pro rata share in such advance in proportion to the amount of his payments. If such sale shall result in a lesser price than the original, the amount of his payments returned to him shall be charged with a pro rata amount of such decrease proportioned to the amount of his payments.

An agreement shall be signed by each purchaser with the Government covering these conditions, and any assignment of such agreement shall work a forfeiture thereof.

Should this system be found a success the Government

will then place in the market lots that have been laid out on the land of Pauahi, South Kohala, Hawaii.

During this last period, the cost of surveying the land offered for sale had to be defrayed by the purchaser, as the Legislature of 1892 failed to make provision in the appropriation for the Government Survey to meet the expense of this work.

The mails from abroad bring an increasing number of letters asking for information as to the soil, climate and lands and under what conditions land can be obtained, what products can be raised and numerous other enquiries of like nature, from parties desirous of obtaining homes in these islands, and much time has been consumed in making answer to these questions.

I trust that this Department will soon be able to collect enough reliable data to publish in pamphlet form full information on these subjects, and I have no doubt that the publishing of authentic information, will be means of bringing to these islands a class of desirable immigrants, who will build themselves permanent homes and rapidly develop industries that now lie dormant.

A special detail report on Government lands, showing the area, rental, value, etc., as prepared by Mr. J. F. Brown of the Government Survey Staff, was published in the Department report for 1890.

This statement has been carefully revised and corrected to date by the same gentleman, and is published herewith as an appendix to the report of the Surveyor General.

HOMESTEAD LANDS.

As will be seen by the Homestead Statement 579 lots have been homesteaded out of 680 now plotted, leaving a balance of 101 lots to be taken up.

There is no doubt that these remaining lots will be all taken in a very short time, as the demand for homesteads is on the increase.

During the period just closed a number of petitions have been received, praying that more homestead plots be opened up, more especially in the Hamakua, North and South Kona, Kau and Puna districts, but no appropriation being available for this work it was impossible to grant their request.

The homesteaders on the several homestead tracts have been industrious and energetic in cultivating and improving their lots. They appreciate the Government's endeavor to enable them to obtain land on easy terms and favorable conditions.

Patents have been issued to the homesteaders of Map 1, Nuuanu Valley, also, to several of the homesteaders on Map 2, Hamakua, Hawaii, who have performed all the conditions of their agreement.

ROAD BOARDS AND ROAD WORK.

Under Chapter 82 of the laws of 1890, the Road Boards were made elective, the members to hold office for two years from the day of election. The first election was held in February, 1892. At the expiration of the two years, the Honolulu Road Board was abolished and those of the outer districts were authorized by Act 65 of the Provisional Government, to continue to perform their duties until otherwise provided by law.

It was hoped that the choice of Road Boards by the elective method would result in the establishment of permanent Boards to direct and control this important work, but the changes have been so frequent that at the end of two years, but few of the originally elected members remain.

As a consequence of these frequent changes, much time

has been consumed in issuing instructions and laboring to prevent a confusion of accounts.

In addition to the regular items for roads and bridges of the various districts, the Legislature of 1892 passed a large number of special road items, many of these, under the second section of the appropriation bill were not available, and some, perhaps, not urgently required.

THE FOLLOWING IS A STATEMENT OF THE SPECIAL ROADS AND BRIDGES APPROPRIATIONS, SHOWING THE ITEMS DRAWN AGAINST.

District.	Sect'on		Appropriation.	Expended.
North Hilo ..	1	Repairing Pohakapuka bridge	$ 1,500 00	
	2	Road up Laupahoehoe gulch	200 00	
Hilo	2	Road from Kaiwiki to Hilo Homesteads	500 00	
	2	Volcano road	60,000 00	$ 47,854 47
	2	Honolii bridge	17,424 65	17,424 65
Puna	2	Road from Kukulu through Puna	30,000 00	
Kau	2	Road from Kahuku to Manuka	500 00	
	2	New road, Kau	10,000 00	6,557 94
	2	Peter Lee road	6,000 00	4,500 00
	2	Road from Hilea to Pahala	3,000 00	
North Kona..	2	Upper main road connecting with South Kona	15,000 00	
South Kohala.	1	Road from Kalahuipuaa, South Kohala, to Kona	600 00	
North Kohala.	2	New road between North and South Kohala	1,022 29	1,022 29
	2	Road from Kohala to Waimea	2,000 00	
Hamakua ...	2	New grade Kaula gulch	1,000 00	
	2	Re-grading roads	2,000 00	
Lahaina	2	Road from Lahaina to Maalaea	5,000 00	
Wailuku	2	Road from Wailuku to Kahului	3,000 00	
	2	Road from Wailuku to Maalaea	3,000 00	
Makawao...	1	Repairing road to Kapuhau	600 00	
	2	Road through Kula	10,000 00	
	2	Road from Makena to Kula	10,000 00	

District.	Section.		Appropriation.	Expended.
	2	Road to homestead lots, Kula	500 00	
Molokai	1	To complete Honouliwai bridge	466 50	466 50
Honolulu	1	Honolulu, special	35,000 00	35,000 00
	1	Honolulu, supplementary	$ 4,000 00	$ 3,761 32
	2	Honolulu, macadamizing and paving streets	12,064 76	12,064 76
	2	Macadamizing Kuakini street	1,500 00	
	2	Extension of the road east side of Kalihi Valley	5,000 00	
	2	Extension of Kamehameha IV. road	3,000 00	
	2	Extension of School street towards Insane Asylum	3,000 00	
	2	Repairing road to Kalihi Receiving Station	500 00	
	2	Repairing and widening road from Waikiki to Kalia bridge	750 00	
	2	Purchase of right of way and completion of Ocean Beach road		
	2	from Kakaako to Waikiki	7,500 00	
	2	Nuuanu Pali road	37,000 00	1,082 73
	2	Opening street from Smith bridge to Liliha street	5,000 00	
	2	Manoa roads	4,500 00	
	2	Widening Waikahalulu street	2,000 00	
	2	Extending Liliha street to Wyllie street	2,500 00	
Koolauloa	2	Repairing road and breakwater	3,000 00	
Waimea	2	Road from Haena to Hanakapiai	500 00	
	2	Road from Hanakapiai to Kalalau	500 00	
	2	Pali road at Kaneohia and road at Hanepepe	2,000 00	
Lihue	2	Bridge at Wailua	15,000 00	9,597 37

AMOUNTS EXPENDED IN THE SEVERAL DISTRICTS FOR ROAD PURPOSES DURING THE BIENNIAL FISCAL PERIOD ENDING MARCH 31, 1894.

District.	Road Tax Fund.	Roads and Bridges, Section 1.	Roads and Bridges, Section 2.	Roads and Bridges, General.	Special Items.	Total.
North Hilo	$ 4,692 25	$ 1,500 00	$ 130 48			$ 6,322 73
Hilo	18,245 33			$ 249 50	$ 65,279 12	83,773 95
Puna	1,513 39					1,513 39
Kau	5,435 98				11,057 94	16,493 92
South Kona	1,815 75		1,551 50	17 00		3,384 25
North Kona	1,494 00	20 00	1,606 98			3,120 98
South Kohala	763 75					763 75
North Kohala	4,101 28		1,167 20		1,022 29	6,290 77
Hamakua	8,075 27					8,075 27
Lahaina	2,467 02					2,467 02
Wailuku	12,683 04					12,683 04
Makawao	6,540 57					6,540 57
Hana	6,705 59					6,705 59
Molokai	2,834 00				466 50	3,300 50
Lanai	200 00					200 00
Honolulu	34,462 70	30,000 00	20,000 00	8,433 65	* 51,908 81	144,805 16
Ewa and Waianae	6,083 46		661 00			6,744 46
Waialua	2,975 70					2,975 70
Koolauloa	2,780 34			2,663 73		5,444 07

* This includes the sum of $1,082.73 expended on the Nuuanu Pali road.

AMOUNTS EXPENDED IN THE SEVERAL DISTRICTS FOR ROAD PURPOSES DURING THE BIENNIAL FISCAL PERIOD ENDING MARCH 31, 1894.

District.	Road Tax Fund.	Roads and Bridges, Section 1.	Roads and Bridges Section 2.	Roads and Bridges, General.	Special Items.	Total.
Koolaupoko	$ 7,150 32		$ 1,370 00			$ 8,520 32
Lihue	4,861 18				$ 9,597 37	14,458 55
Koloa	3,634 72					3,634 72
Waimea	11,051 71					11,051 71
Hanalei	3.705 20					3,705 20
Kawaihau	6,703 68					6,703 68
Niihau	160 00					160 00
	$161,136 23	$ 31,520 00	$ 26,487 16	$ 11,363 88	$139,332 03	$369,839 30

AGRICULTURE AND FORESTRY.

The Legislature of 1892 passed an Act to establish a Bureau of Forestry and Agriculture under the Department of the Interior.

This Bureau consists of an Honorary Board of five, of whom the Minister of the Interior is *ex officio* President, and also of a salaried Commissioner, who, in addition to his other duties, acts as Recording and Corresponding Secretary to the Board.

Under this Act the Board was organized March 29. 1893, with the following appointments:

WM. G. IRWIN,
ALLAN HERBERT,
JOHN ENA,
ALBERT JAEGER.

At their first meeting the Board appointed Joseph Marsden as Commissioner and Secretary, and promptly entered upon the duties assigned them.

For the purpose of concentrating kindred objects under the above Bureau, the following laws are included in and deemed to be the duties of the Bureau of Agriculture and Forestry.

Section 251 to and including Section 254 of the Civil Code, relating to the improvement of Agriculture and Manufactures.

Chapter 30 of the Session Laws of 1876, entitled "An Act for the Protection and Preservation of Woods and Forests."

Chapter 48 of the Session Laws of 1884, entitled "An Act to encourage the production of Ramie and other Fibres in these Islands, suitable for a market."

Chapter 71 of the Session Laws of 1886, entitled "An Act to encourage the manufacture and exportation of Taro Flour."

Chapter 34 of the Session Laws of 1888, entitled "An Act to prevent the introduction of Coffee leaf diseases."

Chapter 59 of the Session Laws of 1888, entitled "An Act to encourage the production and sale of Taro Flour and other products of Taro."

Chapter 65 of the Session Laws of 1888, entitled "An Act to encourage the cultivation and manufacture of Ramie."

Chapter 2 of the Session Laws of 1890, entitled "An Act relating to the suppression of Plant Diseases, Blight and Insect Pests."

Under the last named Act, Boards of Commissioners were appointed in the several districts of the Islands, and under their careful supervision and co-operation with the head Bureau at Honolulu, it is confidently to be hoped that plant blight and insect pests may be no longer a matter of dread to our agriculturists.

The first report of the Commissioner of Agriculture under the new organization is published herewith, and is an evidence that the work is in good hands.

Prompt steps have been taken to exterminate all blight and insect pests now existing and to prevent further introduction of the same from abroad, and to that end the services of Prof. A. Koebele, an experienced entomologist, has been engaged for a term of three years.

The Planters' Labor and Supply Company fully appreciating the value of these efforts, have agreed to bear one-half cost of Prof. Koebele's salary and expenses during his engagement.

The Professor's report of his investigations and the remedies applied thus far, will be found appended to the report of the Commissioner.

IMPORTATION AND INSPECTION OF LIVE STOCK.

The reports to this Department of the Government Veterinary Surgeon and the several Boards of Inspectors through-

out the Islands, appointed under the Act for the prevention of disease among animals, show an encouraging absence of epidemics and a watchful care in guarding against the introduction of animal diseases from abroad. Some valuable stock has been imported for breeding purposes, and a large number of hogs for slaughter.

The following summary from the biennial reports of the Inspectors of Animals of the several districts, will show the importation and inspection of live stock for the two years ending March 31, 1894, and the country from which received.

Port of Arrival.	From.	Stallions.	Mares.	Geldings.	Mules.	Bulls.	Cows.	Swine.	Sheep.	Dogs.
Honolulu	San Francisco	3	18	53	32	5	30	* 3,809	35	35
	Liverpool	..	..	..	....	2	2	.....	....	..
	Australian Ports	..	..	..	....	..	..	....	†188	5
	China and Japan	..	..	..	....	..	..	1	....	25
		3	18	53	32	7	32	3,810	223	65
Hilo	San Francisco	..	3	12	111	..	14	3	....	..
Kahului	San Francisco	3	6	..	....	6	1	.....	....	..
	Totals	6	27	65	143	13	47	3,813	223	65

* For slaughter. † 178 were for slaughter.

PUBLIC GROUNDS.

The original estimates for the care of the Public Parks and the Government Building Grounds at Honolulu were placed at $9,000.00.

These estimates were cut down and the appropriation was placed by the Legislature of 1892 at $7,340.00; as a consequence the appropriation fell short of the requirements, and the Provisional Government appropriated in October, 1893, an additional sum of $1,300.00.

The following statement shows the detail of estimates, amount appropriated and where disbursed:

Apportioned as follows.	Estimates.	Appropriated.	Expended.
Thomas Square	$ 2,280 00	$ 2,000 00	$ 1,798 96
Court House Grounds	1,440 00	1,440 00	1,332 23
Executive Building Grounds	3,500 00	2,600 00	4,500 71
Emma Square	695 00	600 00	518 85
Mausoleum Grounds	600 00	500 00	489 25
Makiki Cemetery	485 00	200 00	.....
	.....	.....	.....
	.....	$ 7,340 00	.....
Appropriation of October, 1893.	.....	1,300 00	.....
	$ 9,000 00	$ 8,640 00	$ 8,640 00

In view of the above I would recommend that at least $9,000.00 be appropriated for the care of public grounds for the coming period.

HONOLULU FIRE DEPARTMENT.

Under the provisions of Act 17, of the Provisional Government, approved February 21st, 1893, the Volunteer Fire Department of Honolulu was disbanded and a "paid department" was organized in its stead on the 24th of the same month.

Under this Act the general care and supervision of the Department is vested in a Board of three Commissioners, who are appointed by the Minister of the Interior, hold office for a term of two years and serve without pay.

The Board appoints the Chief Engineer of the Department, and the salaries and wages of all the employees are determined by the Board of Commissioners, with the consent of the Executive Council.

The re-organized Department has been in service one year,

and consists of two Engine Companies with steam fire engines, one double tank Chemical Engine, one Hose and one Hook and Ladder Company. These companies are equipped in the best possible manner, with first class apparatus, fine horses and all the latest improved appliances for rapid work. The horses are perfectly trained, and the officers and men experienced and well drilled, and they have proved both prompt and efficient whenever called to duty.

A perfect system of telephonic alarm has replaced the clangor of the fire bell, and the companies when called, go expeditiously to their work, without noise or confusion.

In addition to the paid force, one Volunteer Engine Company (China No 5) belonging to the old volunteer system, still exists in the Department, under the conditions allowing "such volunteer companies as the Commissioners shall deem fit." This Company owns its steam engine, an excellent machine, with hose cart and appurtenances, and has a monthly allowance of fifty dollars from the Department appropriations.

The first report of the Board of Fire Commissioners, embodying the two semi-annual reports of the Chief Engineer is published herewith.

The Act creating the paid Fire Department, repealed Chapter 45 of the laws of 1888, and abolished the office of Fire Marshal, but Section 7 of Chapter 68 of the Laws of 1890, "An Act for the protection of life and property against explosive substances, other than gunpowder," imposes upon the "Fire Marshal" the duty of supervising the storage of kerosene, kept for consumption or sale on premises other than the Government Kerosene Storehouses. There being no such officer at present, I would respectfully recommend that the law be amended and this duty be assigned to the Chief Engineer of the Fire Department.

I cordially endorse the other recommendations of the Fire Board, and will comply with their requests so far as the appropriations for this biennial period will permit.

HILO FIRE DEPARTMENT.

The Legislature of 1892 passed "An Act to provide for a Fire Department for the town of Hilo." Under this Act the Hilo Fire Department was organized in February, 1893, on a plan similar to the former Volunteer Department of Honolulu.

The newly formed Department promptly made application for apparatus for the use of their Company No. 1. In view of the limited amount appropriated in their aid, it was deemed advisable to furnish an outfit from such apparatus and material as the Honolulu Department might spare without impairing their own efficiency, and the application was referred to the Board of Fire Commissioners.

With their approval I ordered to Hilo the steam engine formerly in use by Honolulu Company No. 1, the hose cart formerly belonging to Pacific Hose Company, and 100 feet of hose for drill purposes. In addition to this I purchased from their appropriation fund 300 feet of new hose at a cost of $325.00. The Hilo Department erected a temporary structure for the shelter of their apparatus, and in view of affording them a permanent house, the lease of a lot has been secured, 30x77 feet on Waianuenue street, for a term of 13 years, upon the payment of $125 in advance for the term. The following is a statement of the expenses of the new department as paid from the appropriation to the close of the period :

New fire hose	$325 00
Building for apparatus	148 13
Labor on hydrants, repairs, etc	74 49
Sundry expenses, oil, hardware, etc	125 12
Freight	71 00
Pay roll, steward	50 00
Lease of lot	125 00
	$918 74

The contingent appropriation of $800 under Section 2 of the Appropriation Bill has not been drawn against.

LAUNDRIES AND WASH HOUSES.

The Legislature of 1880, as a sanitary measure, passed an Act authorizing the Minister of the Interior to erect laundries and wash houses on the banks of the "Makaho" (or Nuuanu) stream, on the land called "Kaliukai," and to let the same to parties applying therefor.

The laundries to be under the supervision and control of the Board of Health, and all parties carrying on the business of laundry keeping, or washing for hire, within the limits of the City of Honolulu, except in such buildings as shall be erected under this Act, shall be liable to a penalty of $50 per day.

During the period 1880-82, the first or lower range of laundries, 16 rooms or compartments, of two stories, was erected at a cost of	$ 5,218 10
In 1882-84 the upper range, 10 rooms, was built at a cost of	7,211 30
Original cost	$ 12,429 40

For improvements and repairs, there was		
expended in 1886-88	$963 57	
In 1890-92	34 32	$ 997 89
A total expenditure to date of		$ 13,427 29

The lower or 16 compartment range of laundries was opened to tenants in February, 1881, and the upper or 10 room range, April 1st, 1883.

The monthly rental of each two storied compartment was placed at $10, and the rooms are always in demand.

The total receipts from rents from the opening of these laundries to March 31, 1894, amount to $35,672.75. This total would have been larger, but in September, 1892, nearly the entire upper range was destroyed by fire.

In addition to the above rent money, each tenant pays water rates; so that if viewed in the light of an investment only, it has proved a valuable one for the Government. As a sanitary measure it has been of far greater value, although its construction was faulty.

The remaining rooms, although in an unsightly and dilapidated condition, and not worthy of repair, are all tenanted, and a large number of Chinese laundries are in operation in all parts of the city.

The Board of Health has, upon several occasions, during the past two years, called the attention of this Department to the unsanitary condition of these laundries, and the lack of the necessary accommodations to enable its Agents to suppress the outside laundries.

A change of locality has been suggested, but the determination of a new site and the lack of an available appropriation for new buildings, has so far retarded this very necessary work. If the much needed improvement of the swampy

tract in this locality by filling in from the harbor dredgings and the building of a bulkhead or retaining wall along the stream frontage, can be promptly accomplished, the present site, with its facilities for drainage to the stream and sea, would seem to be the proper one for the erection of new laundries with every sanitary requirement.

I would therefore urge that the appropriation asked for this important work be made available at an early day.

HONOLULU WATER WORKS.

The biennial report of the Superintendent of Water Works contains some very important recommendations. Honolulu is growing rapidly, and the demand for water is steadily increasing. Many of the old mains are of small capacity and clogged with internal growth, and the friction is so great that when the force is weak, many sections of the city are without their water supply for several hours daily. When renewed pressure comes these pipes are continually bursting, and portions of the city are again left without water until the breaks can be repaired.

New mains are urgently necessary on King street, Queen street, Fort street and a part of Beretania street. The present ones are not only incapable of carrying the necessary supply, but some of them have been in use so long that they are not worthy of repair.

The mains at Kapalama, Iwilei and Kakaako are entirely too small to supply those localities and should be enlarged.

The King street main should be 12-inch from the Waikiki road to Liliha street, and 8 or 6-inch from there to the Kamehameha IV road.

The residents at Kalihi now supplied from a private source, the Artesian well at the Kamehameha school, have been notified that this privilege will be suspended after October 1st,

1894. Some provision should be made by the Government to supply them with water. A pumping plant erected in Honolulu with a large main laid along King street and out to the Kamehameha IV road would supply that district.

The reservoir sites and water rights in Nuuanu Valley should all be owned by the Government.

Estimates have been carfully prepared for a "pumping plant" for Honolulu at a cost approximating $25,500.00.

It is proposed to have a Blake's Pumping Engine of the best "Corliss" type, with capacity of from two and one-half to three million gallons in the twenty-four hours, forced to an elevation of one hundred and fifty feet through one mile of twenty inch main, or through a number of mains producing the same results.

The westerly wing of the stone building, formerly used as a barracks, has been selected as a convenient site for the erection of the pumping plant, the pump to be supplied from the Artesian well in the Excutive Building grounds. Should it be found necessary the well at Mililani, the Court House grounds, can also be connected with this plant.

Next to the Government rent roll, the Honolulu water rates represent the largest item of revenue to this Department, and the following statement covering the past twelve years will show that these receipts are steadily increasing:

Biennial period ending March 31st,					1884.....	$40,790 50
"	"	"	"	"	1886.....	48,983 90
"	"	"	"	"	1888.....	78,963 10
"	"	"	"	"	1890.....	80,604 05
"	"	"	"	"	1892.....	84,580 55
"	"	"	"	"	1894.....	85,017 50

The sums asked for permanent improvements to the water system amount to the seemingly large total of $209,651.00.

But referring to the statement of receipts as above the value of the investment can readily be seen, and there is no doubt that these receipts would be largely increased as soon as the contemplated improvements were completed.

Viewed not only as a matter of revenue but in the more important matter of the preservation of the health and comfort of our increasing population, it is important that our water system and supply should be made as perfect as possible.

FIRE HYDRANTS.

Fifteen standing hydrants have been placed in position during the last period, and there are fifteen more on hand which the Water Superintendent proposes to erect as soon as the mains are renewed.

The old ground hydrants, of which there are 111 remaining, should be replaced by the standing hydrants as rapidly as the mains are improved.

These hydrants have ever proved a source of trouble, expense and vexation, and have necessitated a continued patrol on the part of the Fire Department to keep them uncovered and in condition for use in case of fire. It is difficult to connect them with the fire hose, and at best the couplings are insecure, and are the cause of great waste of water at times when every gallon is of value.

PUBLIC WORKS.

In the report of the Superintendent of Public Works will be found details of the important work of dredging the Honolulu harbor bar, an improvement that has opened our inner harbor and wharf facilities to steamers of the largest class touching here from China, Japan, Australia, San Francisco and British Columbia.

The dredging of the inner harbor and the building of additional wharf accommodation is being pushed as rapidly as possible, and it is to be hoped that by the end of another year we will have ample wharf room to accommodate all comers.

The other improvements and repairs to landings, buoys, bridges, buildings and special road work are noted in careful detail, and the recommendations for special work in the coming period are worthy of earnest consideration, and meet with my cordial approval and support.

Respectfully submitted,

J. A. KING,

Minister of the Interior.

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REPORT

UNIVERSITY OF HAWAII
LIBRARY

OF

THE MINISTER OF THE INTERIOR

TO THE

PRESIDENT OF THE REPUBLIC OF HAWAII

FOR THE

NINE MONTHS

ENDING DECEMBER 31, 1894.

HONOLULU:
ROBERT GRIEVE, STEAM BOOK AND JOB PRINTER,
209 Merchant street (up stairs).
1895.

REPORT

OF

UNIVERSITY OF HAWAII
LIBRARY

THE MINISTER OF THE INTERIOR

TO THE

PRESIDENT OF THE REPUBLIC OF HAWAII

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REPORT

OF

THE SURVEYOR-GENERAL,

HONOLULU, DECEMBER 31, 1894.

—o—

To J. A. KING, MINISTER OF THE INTERIOR—

SIR: I have the honor to submit to you the following report of the Bureau of Government Surveying for the nine months ending Dec. 31, 1894. During this period, pending the session of the Legislature, from reasons of a temporary nature, the utmost economy has been practiced; the general trigonometrical survey of the country has not been resumed, and only the most necessary surveys have been executed.

FIELD WORK.

On the Island of Hawaii, the survey of Maulua Nui, Hilo, by Mr. Lobenstein, was extended to the interior of the island and connected with the primary triangulation, and maps of the same furnished to the Government. In November the survey of the volcano and its vicinity was connected with the primary triangulation and with that of Olaa, and maps of the same drawn for the Government by Mr. E. D. Baldwin.

To investigate the sudden break down in the crater of Kilauea July 11th, 1894, and for other reasons,

Messrs. F. S. Dodge and W. E. Wall were sent July 20th to re-survey the Halemaumau region, as well as the extension of the volcano road into Kau. Mr. Dodge again left for Hilo August 24th, where he was engaged until September 20th in surveying the North Hilo road in the vicinity of Papaikou.

Mr. Kanakanui was detailed December 4th to rerun and mark the boundaries of the homestead lots in Ninole and Wailua, Kau, returning January 1, 1895.

Messrs. J. F. Brown and Kanakanui were employed from October 12th to October 27th, 1894, in surveying the Crown land of Ualapue, Molokai, and in laying out twenty-one lots in the same, to be assigned to the owners of certain kuleanas in the leper settlement, which have been taken possession of by the Government under the Act of October 5th, 1893.

From July 16th till August 12th, 1894, Mr. M. D. Monsarrat was employed in completing the survey of the Island of Molokai, by surveying the northern coast, including the leper settlement.

He has since delivered to the Government a general map of the triangulation of the island, and also detailed maps of the section from Kawela to Mapulehu inclusive, and another of the section from Mapulehu to Wailua inclusive.

In the district of Kona, Oahu, the usual amount of surveying has been done. The lots adjoining the road leading up the Kewalo ridge, and those situated in the wooded region between Puu Ohia (Mt. Tantalus) and Kakea, have been laid out again by Messrs. J. F. Brown and W. E. Wall. The services of Mr. F. S. Dodge and his assistants have been in constant requisition for city surveying, especially in determining

street lines and grades, widening roads and projecting new streets.

OFFICE WORK.

It is not necessry to repeat here my former explanations in regard to the nature of the office work. The amount of it has been greater than usual. For instance, the former surveys and calculations relating to the Pearl Lagoons have been brought together, revised, and entered in a separate book. The same has been done with the Mauna Kea surveys of 1892 and other pieces of work.

There have been registered and put on file in the office 35 maps, and of miscellaneous documents connected with the survey, 30. There have been furnished 28 new surveys. The number of reports on applications for lease or sale of Government lands has been 62. Of tracings there have been for auction sales 24, all in duplicate;

Grants	40
Road purposes	6
Reports to Minister of the Interior	7
Miscellaneous	72

SCIENTIFIC WORK.

In regard to Meteorology, the usual observations have been kept up, and monthly reports furnished for the benefit of the public. Exchanges are kept up with a large number of foreign weather bureaus. Tidal observatious have been continued with the self-registering tide-gauge, and its record tested and reduced day by day. Tide tables for the port of Honolulu for the year 1895 are included in the Pacific Coast Tide Tables published by the U. S. Coast Survey. At

the time of writing this report these predictions appear to agree remarkably well with observation. The local time has been obtained from transit observations, and furnished to the public, as well as the Greenwich time.

The results of the astronomical and magnetic surveys made by Mr. E. D. Preston in connection with this bureau in 1892 have been worked out, but the final report has not been published.

The declination of the magnetic needle increases regularly from south-east to north-west, except that it is abnormally large on the summit of Mauna Kea and small at Waimea, Kauai. The contrary is the case with the dip of the needle. The declination in 1892 varied from 8° 22′ at Hilo to 10° 3′ at Niihau.

The value of the mean density of the earth deduced from the observations on Haleakala and Mauna Kea agrees very closely with that obtained at Arthur's Seat, Scotland, by Cols. James and Clarke. As stated before, the deflection of the plumb line caused by the attraction of our mountains is extraordinary, amounting at the south point of Hawaii to 67″, and at Kohala to 30″ in the opposite direction. The latitude observed on the summit of Mauna Kea is consistent with the observations taken at Hilo and Kawaihae, and with the mean of the observations at Kahuku and Waikiki, Oahu.

CONCLUSION.

I can only repeat my statement in my last report in regard to the probable demands upon our bureau during the coming year.

The work to be done will largely depend upon the future land policy of the Government, and the action taken by the next Legislature. There will be a greater

demand for information than ever in regard to lands available for small farms.

To assist in furnishing such information, and in promoting the development of the resources of the country, and its settlement by worthy, industrious citizens, will be not only the duty but also the privilege of your employees in this bureau.

I remain,

Very respectfully,

Your obedient servant,

W. D. ALEXANDER,

Surveyor-General.

REPORT

OF

THE REGISTRAR OF CONVEYANCES,

HONOLULU, DECEMBER 31, 1894.

—o—

J. A. KING, MINISTER OF THE INTERIOR:—

SIR: In reporting upon the work of this Bureau for the nine months following last biennial period to close of 1894, there is little to present aside from the ordinary routine of business. This has resulted proportionately, in revenue, a trifle over the estimate given in last report, reaching for the nine months ending Dec. 31st, 1894, the sum of $6,304.75. This amount has been obtained from the following divisions of work, viz.:

Received from recording fees		$5,719 50
" "	search fees	57 25
" "	certified copies miscel. insts.	227 50
" "	acknowledgments	14 00
" "	copies R. P. and L. C. A	286 50
Total		$6,304 75

It was a matter of much relief when by supplementary appropriation for Copying Indexes this important interrupted work was resumed. The Indexers have so far progressed with their duties as to finish the abstracting from the records and comparing, this day, and are now ready to enter same into the fourth and

completing set of Indexes, to connect with the current series, so that we begin to feel that the end of this very essential convenience of the office is within sight.

The frequent receipt of instruments from abroad for record, with certificates of acknowledgment differing in form to that in vogue here as to require their return for amendment, to comply with our statutes, suggests whether or not the legal forms in vogue in older lands—whether it be acknowledgment, or certificate of signature and execution—is not as safe for us to follow and permit their record here as in their country of origin. The delays necessary to affect compliance with our statutes is doubtless a hardship in every case which brings us under charges of injustice as "sticklers for technicalities" that could possibly be easily remedied.

This matter has had the attention of certain members of the Cabinet, as also the advisability of correcting a few sections of the Stamp Act for the better protection of the Government, and removing grounds for conflicting views in several parts of its schedule.

I regret to report so much conflict under this latter head, but the past year has again been a trying one, as correspondence with the Attorney-General for rulings on disputes thereunder can testify. It is a matter of satisfaction, however, to find one's effort to carry out the law sustained in every case but one, in all the questions so far submitted for decision.

I have the honor to be,
Your obedient servant,

THOS. G. THRUM,
Registrar of Conveyances.

REPORT

OF THE

COMMISSIONER OF AGRICULTURE,

HONOLULU, DECEMBER 31, 1894.

—o—

J, A. KING, MINISTER OF INTERIOR,
AND PRESIDENT OF THE BUREAU OF
AGRICULTURE AND FORESTRY—

SIR: I have the honor of presenting the following report of the operations of the Bureau of Agriculture and Forestry during the past nine months, from April 1st to December 31st, 1894:

EXPENDITURES.

Pay of Commissioner and Secretary 9 months	$1350 00
" Gardener, Nursery	765 00
" Forester, Makiki	675 00
" Laborers, Makiki	664 52
" Laborers, Nursery	404 95
" Prof. Koebele and Incidentals	1495 76
Incidentals, Seeds, Plants, Stationery, etc	441 33
	$5796 56

MAKIKI FOREST.

The work of continuing the re-foresting of the lands of Makiki, Kewalo and Pauoa has been carried on by Mr. David Haughs, the Forester, assisted by a force of five Japanese.

Mr. Haughs submits the following report of the work done during the last nine months:

MAKIKI FOREST, DEC. 31, 1894.

TO J. MARSDEN, ESQ.,

Commissioner of Agriculture and Forestry, Honolulu—

DEAR SIR: The following is a report of work done in Makiki Forest during the past nine months (from March 31 to Dec. 31, 1894):

Principal work done during the period included making leaf pots and transplanting trees; making holes and planting trees; thinning out and cutting dead trees; clearing land for coffee and planting same; hoeing and cleaning trees; making and clearing trails; clearing away brushwood and grass around forest as a preventive against fires; rooting out lantana.

The following is a list of trees planted out:

4,800	Acacia Melanoxylin.
1,456	Acacia Decurrens.
300	Acacia Albizzia.
180	Callophyllum.
50	Inophyllum.
80	Cacoa.
550	Camphor.
120	Ceara Rubber.
500	Cryptomeria Japonica.
460	Eucalyptus.
225	Eucalyptus Robusta.
130	Eucalyptus Baileyona.
350	Eucalyptus Corymbosa.
3,650	Grevillea Robusta.
80	Jack Fruit.
260	Jap Chestnut.
750	Jap Chestnut Seeds.

250	Paulownia Imperialis.
450	Pepper Trees.
100	Lemon.
1,300	Logwood.
230	Mangoes.
100	Avocado Pears.
10	Avocado Pears (large).
50	Date Palms.
480	Sisal.
16,911	

The above trees were all transplanted from the seed beds into leaf pots, where they remained until well established and weather suitable for planting out. I would recommend the above method in preference to all others, and especially so in dry locations. When the soil is moderately damp, planting in this manner can be carried on without the least danger of losing a single plant. In transplanting from the seed bed into the leaf pots the roots of the plants should be pruned; it is not always necessary to use a knife to do the pruning. When the roots are young and tender the thumb nail will answer the purpose; by pruning a little piece off the tap root will cause many small roots to sprout out, and in time will be more likely to supply the tree with the necessary sap than one or two long bare roots.

I would recommend the planting of different kinds of Acacia on dry ridges in preference to the Eucalyptus. The following kinds I think most suitable: Acacia Melanoxylin, Acacia Decurrens, Acacia Pyenantha, Acacia Mollissima; also Grevillea Robusta and Pepper trees.

A considerable amount of the Eucalyptus in the lower part of the old forest have died during the past six months. I think the cause of this is owing to the rocky nature of the bottom soil and the long dry season. The imported trees have not made much progress, owing to the long dry season, and until the roots get to a certain depth where it is moist enough to keep the plants supplied with sap during the dry season, they will not make much headway. The other forest trees are all growing well; also the large Avacado Pears and mangoes, which were lifted from the gulch and planted higher up the slopes.

Since last March we have been planting the following places: Part of the east side of Pauoa; the chestnut seeds to the east of the grass house on the side of Tantalus above the road; the coffee, of which there is an acre and a quarter, is planted a little farther along on the lower side of the road. At present we are planting in the valley below the quarters, and are about half-way to Punchbowl.

The following is a list of trees in leaf pots and boxes:

2300 Cryptomeria Japonica.
600 Casuarina Equistifolia.
162 Casuarina Quadrivalvis.
208 Camphor.
128 Burmah Bamboo, from seed.
80 Date Palms.
20 Avocado Pears.
75 Jack Fruit.
80 Japan Chestnuts.
50 Tea.
234 Liberian Coffee.
520 Logwood.

40 Sandalwood.
100 Teak.
100 Paulownia Imperialis.
180 Eucalyptus Corymbosa.
275 Eucalyptus Baileyona.
50 Australian Native Cork.
350 Japan Persimmon.

5542

The following are the different kinds of seed planted in seed beds:

Araucaria Excelsa.
Sandalwood.
Acacia Melonoxylon.
Casuarina Quadrivalvis.
Casuarina Glauca.
Cryptomeria Japonica.
Grevillea Robusta.
Australian Cork.
Eucalyptus.
Syncarpa Laurifolia.

Plants in Nursery:

25 Canaigre.
36 Grape Vines, Scuppernong.
20 Grape Vines of other kinds.

The imported trees and seedling oranges in nursery are the same as in former report.

I have the honor to be
Your obedient servant,
DAVID HAUGHS, Forester.

While continuing the planting of the dry barren slopes and ridges with such economic trees as seem best adapted for these localities, an effort has been made to turn the valley bottoms to a better purpose by planting them with such fruit trees as seem suited to the soil and climate of these Islands.

In pursuance of this purpose there have been planted fifteen varieties of oranges, five of citron, three of lemon, four of persimmon, three of almond, two of guava, three of figs, three of olives, five of grapes and four of peaches. In order to plant these trees some thinning out of the Eucalyptus had to be done, and this will be carried out to a greater extent in the future until the valley below the forester's house is entirely planted with such varieties of fruit trees as our experience teaches us will flourish in this country. In a few years time this valley will form a fine orchard, and lying as it does on the road to Tantalus, is easy of access, and will no doubt be visited by the public generally and especially those interested in fruit culture, who can thus obtain valuable information as to the best kinds and varieties of fruit trees to plant.

GOVERNMENT NURSERY.

The work of propagating and distributing plants and trees at the nursery on King street has been continued under the supervision of Mr. H. J. Rhodes, the gardener. For the nine months ending December 31, 1894, there has been distributed the total number of 14,040 trees and plants, of which the general public have received 13,000; public institutions 244, and to persons abroad who have promised to send seeds in exchange 796.

The varieties of trees and palms distributed are named in the following list, the figures indicating the number of each kind now on hand at the nursery:

5000 Grevillea Robusta.
1500 Algeroba.
50 Camphor.
100 Cacao.
50 Mosso'ai, from Samoa, (native name).
2000 Eucalyptus, 13 varieties.
200 Monterey Cypress.
1000 Casuarina, 3 varieties.
1000 Liberian Coffee.
100 Arabian Coffee.
700 Cryptomeria Japonica.
200 Rose Apple.
100 Tamarind.
200 Japanese Chestnut.
100 Poinciana Regia.
75 Stephanotis.
100 Ceara Rubber.
100 Clerodendron, Balfourii.
100 Bhil Fruit.
500 Pepper Trees.
2000 Miscellaneous trees and plants (name unknown).

FRUITS.

300 Jack Fruit.
500 Strawberry Guava.
1200 Mangoes.
500 Chinese Orange.
250 Macadamia, (or Queensland Nut).
300 Papaia.
5000 Seedling Orange.

5000 Seedling Lemon.
250 Avocado Pear.

PALMS.

1200 Pritchardii Martii.
100 " Gaudichaudii.
3500 Ptychospermum Alexandre.
1000 Thrinax Argentea.
100 Elaeis Guineensis, (Oil Palm).
200 Arenga Sacharifera.
300 Livistonia Rotundifolia.
2000 Areca Rubra.
2000 Pandanus, (native Lauhala).
3000 Latania Bourbonica.
2000 Brahea Filamentosa.
1000 Caryota Urens, (Wine Palm).
200 Areca Catechu, (Betel Nut).
1000 Oreodoxa Regia, (Royal Palm).
500 Sabal Blackburniana.
250 Areca Alba.
800 Seaforthia Elegans.
200 Chamaerops Fortunaii.

DISTRIBUTION OF SEEDS.

During the past nine months the following varieties of seeds have been imported and distributed by the Bureau:

Acacia Decurrens, (Black Wattle) wood valuable for staves and turners' work. The bark is rich in tannin; also yields a gum similar to gum arabic. This tree is particularly valuable for planting in treeless localities, as it will do well in exposed situations.

A. Pyenantha, (Golden Wattle) second only in

importance to the preceding and applicable to the same uses. It will grow in almost any soil.

A. Dealbata. This tree prefers a moist soil, and sometimes attains a height of 150 feet; yields a good timber for coopers' work; also supplies a first-class fuel of great heating power.

A. Melonoxylon. (Blackwood tree.) This tree has proved the fastest grower of all the trees planted in the Makiki Forest. It furnishes a splendid wood valuable for furniture and many other uses. It is used for veneers; it takes a fine polish, and is con sidered almost equal to walnut. (Muller).

E. Globulus. (The well known blue gum.) This tree has proved to be well adapted to this country, and is one of the few trees that will grow and flourish in localities exposed to the full force of the trade winds. It is probably the best tree to plant for a wind break and shelter in localities where it is desired to raise forests.

E. Longifolia. (Woolly Butt.) Yields a useful timber. Attains to a large tree and grows well in almost any situation.

E. Diversicolor, (the Karri of Southwest Australia.) A colossal tree sometimes reaching 400 feet in height. Furnishes a first-class timber for ship and boat planks and many other purposes; of quick growth, and fine shady foliage. It is well suited for avenue planting. (Muller).

E. Rostrata, (Red Gum.) The timber of this tree is one of the most highly esteemed in all Australia. It is hard, strong and extremely durable, either above or under ground, or in water; thrives best in moist soil. (Muller).

E. Viminallis, (White Gum.) On rich soil this tree grows to gigantic dimensions, over 300 feet in height, with a stem 15 feet in diameter. The timber is light-colored and clear, suitable for shingle, fence rails and ordinary building purposes.

E. Saglina, (Flooded Gum.) A tall, straight stemmed tree, obtaining a diameter of ten feet with wood of excellent quality; requires a rich moist soil.

E. Citrodora, a handsome slender tree, supplying a useful timber. The leaves yield a rather large supply of volatile oil of lemon-like fragrance. (Muller.)

E. Amygdalina, (Giant Gum.) Occasionally attains a height of 400 feet, but only in forest glens. The wood is used for shingles, rails and inner building work. (Muller.)

E. Marginata, (the Mahogany tree of Southwest Australia.) Famed for its indestructable wood, which is not attacked by the teredo or termites. (Muller.) Suitable for planting on our higher mountain lands.

Casuarina Equistifolia, known on these Islands as the Iron Wood tree. This tree does best in low, sandy soil near the sea, but also grows well in our higher elevation, and will stand considerable wind.

C. Glauca, another variety of the same genus. Important for its rapid growth, its resistance to exposure for shelter plantations and its speedy supply of fuel. (Muller.)

C. Quadrivalvis, (the coast she-oak of South Australia.) Suitable not only for coast sand, but thriving on barren inland hills; cattle are fond of the foliage. (Muller.)

Schinus Molle, (Pepper tree.) A beautiful garden or lawn tree of graceful drooping habit.

that no person but those who fully intend to pla them will apply for seeds.

CANAIGRE.

(Rumex Hymenosepalus.)

Some six months ago the attention of your Commi sioner was drawn to this wonderful plant and th possibilities of its industrial cultivation in this cou try. Through the kindness of Mr. H. P. Wood, ou Consul at San Diego, a number of copies were receiv ed of a report on Canaigre, prepared by C. B. Colling wood, J. W. Toumey and F. H. Gulley, all member of the staff of the Arizona Agricultural Experimenta Station.

This report (the greater part of which has been published in the Commercial Advertiser) gives a clear and concise account of the history, geographical distribution, chemical analysis, market demand and cultivation of this remarkable plant.

Canaigre belongs to the Dock and Sorrel genus, of which many varieties are found in both hemispheres; but this particular species (Rumex Hymenosepalus) is peculiar to Mexico, Arizona and New Mexico, and as far as I can learn, it has not been found in any other country.

The chief value of Canaigre lies in the fact that the roots contain a very large percentage of Tannic Acid, the sliced and dried roots containing from 25 to 30 per cent.

As a tanning material Canaigre has met with much favor wherever it has been introduced, and the only difficulty regarding its general adoption by the tanning trade is the very limited supply which, up to

the present time, has been confined to the wild growth found in Arizona and New Mexico. This wild growth is now practically exhausted, that is to say, all the growth found within profitable hauling distance to the nearest railroad.

To meet the constantly increasing demand for this tanning material, several enterprises have been started in California, New Mexico and Arizona for the purpose of cultivating the roots on a large scale. At Deming, New Mexico, a large factory has been erected for the purpose of making an extract from the roots; an extract is made of semi-solid consistence which contains 45 per cent. of tannic acid. This is sold in carloads of 16 tons, at 5½ cents per pound. This extract has been received with such favor by the tanning trade that the Deming company have been unable to procure sufficient roots to supply the demand for their product, and to ensure a supply of roots for their factory, have planted 3000 acres of the tubers.

As far as I can learn the only object in making a condensed extract from the roots is to save transportation charges. The sliced and dried roots, although being equally desirable, for tanners use, are quite bulky; while the extract with a much greater content of tannic acid, occupies comparatively but little space.

From the amount of information at hand it is certain that all the Canaigre these Islands can produce will find a ready sale in all the markets of the world, and at prices that will prove remunerative to those engaging in its cultivation. A letter received by this Bureau from the German Tanning School at Freiburg, Saxony, states that the sliced and dried roots containing an average of 30 per cent. of tannic acid,

would find purchasers at $45.00 per ton; also that the extract would find a ready sale at a price proportionate to the amount of tanning material contained.

Messrs. Martin & Miller, a large tanning firm at Glasgow, Scotland, write that Canaigre roots sliced and dried and packed in bags will be worth £8 per ton in that country; but if the article was regularly put before the market in a satisfactory condition, it is quite possible it may fetch a higher price as it becomes better known.

All tanners who have used or tried canaigre state that it is a first-class tanning material; and all that is needed is that the supply shall be ample and certain, and it will be adopted at once by he tanning trade. Although the roots in a wild state have only been found in loose sandy soils, it has been conclusively shown that better results are obtained by planting the roots in heavier and richer soils; provided such lands are well ploughed and harrowed before planting. Not only is the yield largely increased by cultivation, but it has been demonstrated that the percentage of tannin does not decrease, but on the contrary, tends to increase. (Trimble.)

The cultivation of canaigre is similar to that given Irish potatoes. The land should be well ploughed and harrowed, and the young or small roots planted nine inches apart in rows thirty inches wide. The roots should be covered with two to four inches of soil, and it is stated in the Arizona report that the yield on well prepared land by planting one year old cultivated roots should reach fifteen tons to the acre, and twenty tons is within the possibilities on good land properly planted and well taken care of.

As to the suitability of our soil and climate for the successful cultivation of canaigre, it would seem that we are especially favored in both respects. Last August the writer addressed a letter to Mr. F. H. Gulley, M. S., the director of the Arizona Experimental Station, giving a description of our leeward lands, temperature, elevation, character of the soil, etc., and stating that such lands were kept moderately moist by rainfall from November to February. In his reply Mr. Gulley states that our soil and climate should be well adapted to the growth of canaigre, and our rainy season comes at the right time.

During the past four months this bureau has imported from New Mexico forty tons of the roots for planting. These roots have been imported for private parties on Oahu, Maui, Hawaii and Kauai, and have all been planted, the total area being about seventy-five acres.

Regarding these importations, I would say that Mr. H. P. Wood, our Consul at San Diego, has rendered valuable assistance at considerable expenditure of time and trouble and without any charge whatever. He has attended to the purchase and shipping of the several consignments of roots which have all been received in good order.

Reports have been received that the roots have started well and are growing well. There seems to be no doubt that the plant will grow well almost anywhere on these Islands, and the only question yet to be determined is, will the roots yield well and contain the usual percentage of tannic acid. The next six months will determine these points, and if settled satisfactorily an industry will be established that will

advance with rapid strides and put to profitable use tens of thousands of acres of land that now yield little or nothing beyond affording a scanty pasture during the winter months.

In regard to the kind of land on these Islands that is suitable for the cultivation of this plant, I would say that almost any land that can be ploughed from sea level up to 4000 feet elevation upon which sufficient moisture falls to keep the grass green during November, December and February, will suit this plant. Canaigre makes its greatest growth during these months, and long, hot, dry summers are essential for developing the tannic acid in the roots. Apart from its commercial value canaigre has another important quality which should receive the immediate attention of our sugar planters. The writer has been informed by undoubtedly the best authority in this country, that canaigre is a proper rotation crop to alternate with sugar cane, and cane grown on land from which a crop of canaigre has been taken will yield at least 25% more than if the canaigre had not been grown. This method of rotation of crops, so much studied and practiced in Europe, has received no attention in this country. As shown by the plants now growing here, canaigre has a great number of large fleshy leaves; these are left to enrich the soil, only the roots being removed. These leaves decomposing and being ploughed into the soil afford a large amount of plant food, which is readily assimilated by the growing cane. On the other hand, from a cane crop the cane only is taken away, leaving an immense mass of fine fibrous roots to decompose in the soil and afford food to the canaigre crop. It is a well known fact that

different plants require and draw on different elements in the soil in the process of their development, and it is an equally well known fact that all plants draw a great part of their sustenance from the atmosphere. Land that is almost barren can be brought up to a state of fertility by green manuring, that is the planting or growing of such seeds as will grow on poor land, and when grown ploughing it under, when a better class of crop can be sown and again ploughed under. Land that would only grow a very scanty crop of rye has in three years been brought to a state in which fair grain crops were raised, and by judicious use of cheap fertilizers and rotation crops, kept permanently in that condition.

Regarding the prospect of competition in New Mexico and Arizona where the cultivation of canaigre is being rapidly pushed, I would say, that these Islands have particular advantages over those places.

In the first place, we have cheaper labor, although as compared with cane, canaigre will require but little labor.

Secondly, we have an immense advantage in position; almost all our cultivable land is situated within easy distance of water transportation, while all parts of the United States where canaigre can be cultivated, is situated long distances inland, and foreign markets can only be supplied from there at a large expense for railroad transportation. Canaigre, both the extract and the dried and sliced roots, can be transported from any parts of the Islands to Europe at a less cost than it can be transported from say New Mexico, to any part of the American sea board. This fact is recognized by the Extract Company, at Dem-

ıg, New Mexico. They write that whenever we pro-
uce enough canaigre root to keep an extract factory
ınning, they will be glad to come here and erect the
rst works, and turn over their Russian and Pacific
oast trade to the new works and thus escape the
eavy transportation charges they now pay the rail-
oads.

The planters and capitalists of this country are not
ıcking in enterprise, and if our experiments in grow-
ıg canaigre are successful, there will be no lack of
apital forthcoming to erect all the works that may be
ecessary for the working up of the product.

FIBRE PLANTS.

The cultivation of Sanseveiria, or Bow String Hemp,
s slowly but surely going ahead. A number of coffee
lanters on Hawaii are establishing nurseries of this
lant, and as its merits become better known more
eople will engage in its culture.

Regarding the yield of fibre per acre and the length
f time it takes to grow the first crop on these Islands,
othing definite is known at present. At the Govern-
ıent Nursery on King street a piece of land has been
lanted with Sanseveiria. It has been growing a little
ver twelve months, and has made such progress that
; is possible it may be fit to cut and clean in twelve
r fifteen months more. The first crop takes con-
iderable time—in fact, until the ground is entirely
lled with the underground stems, or rihzomes, and
he leaves (which by this time will have fully occu-
ied the surface of the land) are three feet six inches
ong. After the first crop is gathered the second crop
ill mature inside of twelve months, and upon good

moist land a crop can be cut every year for ten years following without re-planting.

During 1893–4 over 90,000 Sisal hemp plants were imported into this country from Florida and the Bahama Islands. The growth of these plants has been very satisfactory, and there has been a large increase in the number of plants from suckers thrown out by the older plants, and this increase will continue until the older plants run to pole, when there will be an enormous number of young pole plants available for planting. There is no reason why the cultivation of Sisal Hemp should not become an important industry in this country. It is probably the only plant that will put to profitable use tens of thousands of acres of rocky, dry lands that are now utterly valueless.

FRUIT CULTURE.

The soil and climate of these Islands are extremely well adapted to the cultivation of a great variety of fruits; but there has been little or no systematic cultivation of the fruits that are known to thrive in this country. The cultivation of Avocado Pears could be made a most profitable business. The fruit would find a ready sale in California, but at present there is barely enough of the fruit grown to suppply home consumption, and much of that is of an inferior quality. The Avocado Pear does not grow true from seed, and unfortunately the tree is not susceptible to the ordinary methods of grafting and budding. All attempts to perpetuate a particular variety of the fruit by these methods have failed. Layering has been successfully tried, but this is a slow and tedious process, occupying nine or ten months time. A method of inarching prac-

e mango (which like the Avocado
'ted and budded by the ordinary
ll probability prove successful.
e carefully tried on some young
overnmeut Nursery. The process
in a former report, and for the
rested is again repeated.

ould be grown in a tub or pot ten
liameter, and when the stem has
of one-half to five-eights inches
ld be taken to an old tree that is
fine quality of fruit. Two slant-
ıde in the stems, and one-half of
ɔm (two to three inches long) re-
t-bearing branch of the old tree, as
ɔter as possible, and remove a like
uts in the young tree and in the
ach other. Bind the parts firmly
nd cover them with grafting wax.
parts will have grown together.
ɔf the old tree (which up to this
ıed to the parent stem) should be
tem of the young tree; the top of
ld also be cut off close to where
, leaving the branch to form the
In cases where the branches of
each low enough, it will be neces-
ıng tree on a platform or suspend
ld tree. This operation will not
pagation of the desired variety of
ɜ will come into bearing much
hoped that others will experiment

in this direction
trees would pro
Peaches hav
is, compared t
owing to the f
study of the v
dreds of trees
planted in di
they did not
peaches wer
native peac
some variet
Florida tha
These vari
bers, and
fruit in ou
Orange
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has to b
Even to
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In ma
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the be
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No
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direction. A five acre grove of grafted pear would prove a gold mine to the possessor.

ches have not done well on these Islands, that npared to the California fruit; but this has been to the fact that no one until lately has made a of the varieties suitable for this country. Hun- of trees have been imported from California and ed in different parts of the group. In many cases lid not fruit at all, and where they did fruit the es were of a miserable quality, worse than our peach. During the past two or three years varieties of peach trees have been imported from la that have done well and borne good fruit. varieties are now being imported in large num- and in a year or so we may expect to see the in our markets.

anges and limes of the very finest quality can be n here, but in order to do this something more o be done than just to plant a tree and let it grow. to import and plant the improved varieties does olve the problem.

many instances it takes several generations of a t to become acclimated when transported to a new try. It is all very well to import grafted trees of beautiful navel orange; remember that it has been loped and grown in a very different soil and ate than ours, and will take some time to adapt f to its new home.

ow in all parts of these Islands we have an orange k that is hardy and well acclimated, and which in y cases produces a good, sweet orange (perhaps ing the fine flavor of the Washington navel). There ld be no finer stock upon which to bud and graft

Washington navel or any other good variety which
desired to grow in this country. While Kona
ges sell for one to two dollars a hundred, Wash-
on navels from California are bringing fifty cents
zen.

imes too are imported; this should not be. As
l limes as can be found in any part of the world
be grown here, if only a little care and intell-
ce is exercised in their cultivation.

he operations of grafting and budding are so simple
one lesson is sufficient to teach almost any person
one particular method. The principal thing to
n, apart from the mechanical work, is the proper
on in which to graft and bud. The seasons in
country are faintly marked compared with north-
countries, and it has been said that no one knew
proper season in which to graft and bud the
ge in this country. The fact is that budding can
one all through the summer and fall if the weather
ry. Mr. Rhodes, in charge of the Government
sery, has been very successful in budding many
s fruits on orange and lemon stocks.

ring the past year many persons have availed
selves of the services of the Bureau in procuring
varieties of fruit trees, plants and seeds from for-
countries. Being in receipt of catalogues from
arts of the world, the Bureau is enabled to give
person particulars as to the cost of any trees,
s or seeds suitable for their particular locality,
ll orders are filled by the Bureau at exact cost.
is method many are induced to plant fruit trees,
dd not only to their comfort but greatly to the
of their homes.

BLIGHTS AND INSECT PESTS.

n March 16th, 1894, Professor Koebele sailed from nolulu on the steamship Alameda for Australia. e object of his mission was to collect and forward Honolulu such parasites and beneficial insects as preliminary tour of these Islands showed him were eded to combat the numerous scales and insect pests at were such a menace to our agriculture. Professor oebele arrived in Sydney early in April, 1894, and at nce commenced to make shipments of beneficial in- ects, principally Lady Birds (Coccinellidae). These vere sent on ice and were invariably received in good rder, and much credit is due the Oceanic Steamship Company for the care taken in carrying these valuable consignments. Messrs. W. G. Irwin & Co., the agents in Honolulu, very kindly gave Professor Koebele a letter to the agents in Sydney, requesting that special care be taken with all the shipments of insects to Honolulu. This has been done, and in addition no charge has been made for freight. The following is a list of some of the valuable insects sent to Honolulu by Professor Koebele:

Coccinella Arenata (Fab.), feeds on Aphidae, psyllidai, Homoptera and Lecanidai.

Leis Conformis (Boisd.) feeds on Aphids.

Coccinella Repanda, (Thumb.) feeds on Aphids.

Neda Testudinaria, feeds on Aphids.

Halzia Pascoei (Gootch.), feeds on Aphids.

Halzia Galbula (Mulsand), feeds on mildew and Aphids.

Verania Lineata, feeds on Aphids. Also three other varieties of Verania, all feeding on Aphidae.

Orcus Chalybeus (Boisd.), feeds on Diaspidinai, Aspidotus, Chionaspis, etc.

Orcus Australasia, feeds on Lecanidae,

Orcus Large Form, feeds on Lecanidae.

Cryptolæmus Montrouzieri, (Muls.) feeds on Dactylopidae and Lecanidae.

Rhizobius Montrouzieri, feeds on Dactylopidae and Lecanidae.

Platyomus, (2) Lividigaster, (Muls.) feeds on Aphidae.

Novius Koebeli, feeds on Icerya Purchasi.

Rhizobius Ventralis, (Gr.) feeds on Lecanidae.

Scymnodes Koebeli, (Blackb.) feeds on Diaspidinai.

Eritionyx Lanosus, (Blackb.) feeds on Diaspidinai.

Rhizobius Cyaneus, (Blackb.) feeds on Eriococcus.

Rhizobius Speculifer, (Blackb.) feeds on Diaspidinae and Chionaspis.

Rhizobius Hirtellus, (Grotch) feeds on Diaspidinae and Chionaspis.

Rhizobius Satellus, (Blackb.) feeds on Diaspidinae and Chionaspis.

Rhizobius Pulcher, (Blackb.) feeds on Diaspidinae.

Rhizobius Caecus, (Blackb.) feeds on Diaspidinae.

Scymnus Notescus, (Blackb.) feeds on Aphidai.

Scymnus Australesiae, (Blackb.) feeds on Aphidai.

Scymnus Flavifrons, (Blackb.) feeds on Eriococcus, etc.

Midas Pygmaeus, (Blackb.) feeds on Dactylopidae.

Gymuscymis Quatromaculatus, (Blackb.) feeds on Lecanidai, etc.

Lypernus Subviridis, (Blackb.) feeds on Diaspidinai.

Cyrenia Nigellum, (Blackb.) feeds on Diaspidinai.

Serangium Maculegerum, (Blackb.) feeds on Diaspidinai.

Rhizobius, (Sp.) from Nerang, Aus., feeds on Diaspidinai.

Rhizobius, (Sp.) from Brisbane, feeds on Red Spider (Tetranychus Telarius).

These insects were all liberated (as soon as possible after arrival) in places where food was most abundant. That all these insects are now well colonized is beyond a doubt, as all the forms have been seen for months after they were liberated, conclusively proving that those seen are the progeny of the first liberated, as very few of the different species of Ladybirds live beyond a few weeks time.

That good work has been done by most of the species is shown by a marked decrease in the various forms of blight. The work of one Ladybird (Cryptolaemus Montrozeri), has been truly marvellous. A year ago, and for the last three years, all the citrus trees (such as the tamarind, orange, lime and lemon) were affected by a blight that was terribly destructive, so much so that it seemed that if relief was not soon obtained the citrus trees would all be destroyed. Many trees in fact did succumb to the effects of the blight which Mr. Maskell has named the Dactylopius Albizzia. The Cryptolaemus soon got to work on this blight, and increased to such a wonderful extent that the ground, walls and fences were soon covered with the full-grown, crawling, white larva, seeking suitable places to pupate and transform into the imago, or perfect stage. Tens of thousands of the larva were collected and shipped to all parts of the Islands wherever any of the Dactylopids were known to exist. A great

number were shipped to Kona to attack the coffee blight (Pulvinaria Psidi, mask), which also belongs to the genus Dactylopidae. For a time the most encouraging reports came of the work this Ladybird was doing on the coffee blight, but latterly letters have been received stating that the bugs do not increase; this is but natural. The Ladybirds have certain times for breeding, usually during the summer months, and during the winter they hibernate. This seems to be the case with the Cryptolaemus, for now hardly one can be found in Honolulu, where three months since hundreds of thousands were to be seen. The work of this bug has been so effective that many orange and tamarind trees that for the last three years have borne no fruit and looked as if they would eventually succumb, have this year come out in full foliage and fruit. Another serious blight (the Dactylopius Longifilus) made its appearance on the Samang and many other trees, and threatened to prove a troublesome pest. The Cryptolaemus, however, made short work of it, and hardly a vestige of it can now be found.

The Red Spider (Tetranychus Telarius) has been troubling the coffee growers at Olaa. This pest increases during dry weather and decreases in wet weather. After some correspondence a colony of a little Scymnus ladybird was received from Southern California by the kindness of Mr. Alexander Craw. These were sent to Olaa. They arrived in good condition, and were liberated on some infected coffee trees, where they at once commenced to work on the red spiders. Without doubt this colony will soon increase and spread throughout the district wherever the red spider is to be found.

The pest that has caused the greatest apprehension and alarm owing to its voracious appetite and the wide range of plants that it selects for its food is the Adoretus Umbrosus, or Japan Bug. It may be, that this bug was introduced from Japan, for it is found there —but it is a native of Ceylon, Java, Sumatra and the Malay Archipelago. Professor Koebele has visited Ceylon in the hope of discovering a parasite for this bug; but nothing of the kind is known there, and the only way they can keep the ravages of the bug in reasonable limit is to set the Coolies to catch the beetles and larva, which last are always found several inches deep in the soil.

It is very doubtful if any parasite will be found that will destroy this beetle, and we will have to rely upon the introduction of such reptiles, bats, birds and small animals as will feed on the beetles and its larva, and will of themselves, prove not to be injurious to anything else.

Professor Koebele recommends the introduction of moles, which are known to live entirely under ground, and are said to live entirely on worms and the larva of insects which it finds in the soil. Bats, too, would undoubtedly feed on the beetle, and would likely prove more efficacious than any bird, for the reason that the beetle only appears at night after dark, and bats only fly at night while nearly all birds go to nest at sundown.

Toads are likely to prove of greater benefit than anything else. During last year some 500 of these batrachians were imported from California and liberated in Nuuanu, Pauoa and Makiki Valleys, and at Waikiki. They have increased in great numbers,

and whether or not it is owing to the toads, or to the winter months not being favorable for the propagation of the beetle, the fact remains that the beetle has become comparatively scarce.

From observations made, it has been found that the toad readily feeds on the beetle, and it has also been seen digging up the ground and feeding on the larva.

The toads from California require water in which to lay their eggs. The adult toad, however, lives on the land.

During the summer months numbers of these toads will be collected and sent to localities on the other islands that are suitable for their breeding habits. These toads are perfectly harmless, only eating insects, working at night and secreting itself during the day.

In other countries toads are known that do not require water for the propagation of their species, and whenever an opportunity offers an effort will be made to introduce some of them into this country.

Professor Koebele may be expected to return here some time during the next three months, when he will have an important work to perform. Professor Koebele will collect and send to the other islands colonies of all the beneficial insects that have been introduced into this island, until all parts of the islands have been properly colonized.

During his sojourn in Queensland Professor Koebele has used every endeavor to discover a parasite for the cane borer (Sphenophorus Obscurus) but met with no success. Some years since, the writer sent some of the borer beetles and larva to the University of California for examination, and asking if any parasite that

would destroy the insect was known. The reply stated that although the insect was known in almost all tropical countries, no parasite for it had ever been discovered, and that if any parasite existed it would be found in New Ireland, as that island was the habitat of the borer. Professor Koebele was instructed to make particular inquiries in regard to New Ireland, and if there was any possible chance of success to visit that island and investigate the borer and its enemy. The result of Professor Koebele's inquiries showed that New Ireland had been fully examined for parasites for the cane borer, and none could be discovered. In fact, the ravages of the borer in that country were greater than in any part of Queensland and Fiji. Formerly the cane borer caused great destruction to the sugar cane in Fiji, fully 52% of the canes being infested. Now, owing to a method employed of trapping the borer beetle less than 7% of the canes are found to be infested. This method of trapping as described by Professor Koebele is exceedingly simple. Pieces of cane are taken and split in halves; the halves are then laid, the cut sides down on the ground, in around the cane fields. During the night the beetles congregate under the pieces of cane to feed on the juice, and are collected every morning by children, who are paid so much a thousand for catching the beetles. On one plantation in Fiji eleven and a half million of the beetles were caught and destroyed in two years. This represents 1350 pounds of the beetle. In one day, under the split pieces of cane for bait, eleven children collected 28,800 of the beetles.

It is to be hoped that our planters will give this

method a fair trial, as it will, if successful, obviate the wasteful necessity of burning off the immense amount of leaves and cane tops that are left on the fields after the cane is carted from the ground. The trash on the fields should be ploughed or turned under the soil, where it will soon rot and supply the soil with a large amount of the humus so much needed by the growing cane.

In order to encourage new industries, I would respectfully recommend that a law be passed giving the same exemption of taxes and custom duties to canaigre and fibre plants as is now given to the coffee industry.

Respectfully submitted,

JOSEPH MARSDEN,

Commissioner of Agriculture and Forestry.

REPORT

OF

THE ROAD SUPERVISOR,

HONOLULU, DECEMBER 31, 1894.

—o—

To J. A. KING, MINISTER OF THE INTERIOR:

SIR: I have the honor to submit my report of the transactions of this Bureau for the nine months ending this date.

The matter of general street repairs throughout the city and suburbs has received constant attention and the work has been wide-spread and thorough.

Emma, Punahou and Piikoi streets, and a portion of Kamoiliili and Waikiki roads have been reconstructed, and all bridge crossings and culverts have been put in thorough order.

The disbursements for the nine months may be summarized as follows:

Street Repairs	$12,279 50
Bridge Repairs	1,043 26
Culverts and Ditches	1,669 15
Street Construction	4,458 38
Quarrying Stone	7,894 73
Live Stock	2,626 00
Horse Feed	5,375 53
Horse Shoeing	517 32
Locomotive and Roller Repairs	1,669 73

Fuel	649 17
Street Sweeper	515 53
Street Sprinkling	715 24
Street Cleaning	1,450 80
Tools and Implements	589 61
Wagons and Carts	827 60
Powder and Fuse	484 63
Stables and Yard Expenses	961 50
Harness Repairs	380 35
Sundries, Miscellaneous	2,640 80
Total	$46,748 83

The receipts of the bureau from sales of old material, sand, rock, manure, etc., amount to $755 25

Respectfully submitted,

W. H. CUMMINGS,
Road Supervisor.

REPORT

OF THE

SUPERINTENDENT OF WATER WORKS,

HONOLULU, DECEMBER 31, 1894.

—o—

J. A. KING, MINISTER OF THE INTERIOR:

SIR: I have the honor of presenting my report as Superintendent of the Bureau of Waterworks for Honolulu for the period from April 1, 1894, to December 31, 1894.

APPROPRIATIONS.

The amounts appropriated for the work of this Bureau for the period were as follows:

Running Expenses	$ 8,500 00
General Repairs	12,000 00
Repairs to Reservoirs	5,000 00
Improvements and Additions	112,000 00
	$137,500 00

EXPENDITURES.

The expenditures to December 31, 1894, have been as follows:

Running Expenses	$ 3,828 87
General Repairs	5,880 04
Repairs to Reservoirs	1,415 50
Improvements and Additions	26,669 28
	$37,793 69

REVENUE OF THE BUREAU.

The receipts of the Bureau during the nine months were $21,836.25, which were received from the following sources:

City Water Rates	$17,436 70
Shipping	3,811 95
Ten per cent. charges	322 50
Turning on Water	32 50
Sale of Taps	232 60
	$21,836 25

NEW PRIVILEGES.

During the above period forty-five new privileges have been granted, rated as follows:

Two at	$ 5 00 per annum.
Four at	10 00
One at	20 00
Thirty-four at	15 00
Four at	25 00

WORK PERFORMED.

A much needed improvement has been made by laying 1022 feet of four-inch pipe on Dole street, from Punahou street to Alexander street. This neighborhood suffered from the want of water when it was plentiful, on account of being supplied from a two-inch main. Since the new four-inch main has been laid no further complaints have been made.

Six hundred and twenty (620) feet of new four-inch converse pipe has been laid on Piikoi street, from Beretania street to King street.

The reservoirs and springs in Nuuanu have been cleaned, and the trestle work at Luakaha repaired.

PUMPING.

In order to relieve the valley system during the severe drought of the past year, it became necessary to place a fire-engine at Thomas Square to supply the residents living on the slope of Punchbowl Hill. The engine started September 14, 1894, working from five to ten o'clock A.M., and four to eight o'clock P.M. This was continued until November 23, 1894, when the drought ceased.

The pump at Makiki was started working May 2, 1894, and continued day and night until the drought ceased, consuming 339 tons of coal. This pump supplied the water front, the residents on the plains and Waikiki. This unexpected drain on the appropriation for running expenses will no doubt cause the same to run short before the end of the period, and accounts for the small balance shown to the credit of that appropriation.

IMPROVEMENTS AND ADDITIONS.

Work was commenced on the improvements to the Water Works system December 5, 1894, with the laying of the new 12-inch main on Beretania street from the proposed pumping station to Emma street. This section was laid at a cost of forty (40) cents per foot which includes the lifting of the old main.

A contract was made with the Honolulu Iron Works Co. for a complete plant of pumping machinery the same to be completed and delivered by the first day of May, 1895, and to cost Thirty Thousand Five Hundred ($30,500) Dollars.

Two 10-inch Artesian Wells were contracted for with the McCandless Bros., contract price eight ($8.00) per foot to be completed by May 1, 1895.

The contract for the water pipe was made with the McNeal Pipe and Foundry Co. of New Jersey. The water gates and pig lead was furnished by Messrs. Holbrook, Merrill & Stetson, of San Francisco.

Work on the new system is being pushed forward with all despatch, and when completed the complaints continually arising from the scarcity of water during the season of drought, will be a thing of the past,

RECOMMENDATIONS.

I would respectfully recommend that an appropriation of Twenty Thousand ($20,000) dollars be made for the purchase of 10,000 feet of 12-inch cast iron pipe to be laid on Beretania street from the pumping station at Alapai street to the Maikiki reservoir, the 8-inch pipe taken up from this section to be re-laid on King street, from Nuuanu street to the Waikiki road. Also an appropriation of Twenty-five Hundred ($2,500) dollars for the purchase of fifty (50) standing hydrants, this amount will cover the expenses necessary to place them in position.

I would also call your attention to the necessity of providing funds for the running expenses of the new pumping station, an appropriation of ($4000) would keep the pump working for six months.

The severe drought of the past year which continued for seven months, exhausted the appropriation for the Makiki pump. This pump is in good order and ready for work at a minutes' notice, but will not be required when the new plant is completed.

Respectfully submitted,

ANDREW BROWN,

Superintendent of Honolulu Water Works.

REPORT

OF

THE CLERK OF THE MARKET,

HONOLULU, DECEMBER 31, 1894.

—o—

J. A. KING, MINISTER OF THE INTERIOR:

SIR: I have the honor to submit herewith my Report as Clerk of the Market for the period extending from April 1st, 1894, to December 31st, 1894.

RECEIPTS.

The receipts for the nine months have been as follows:

Rents from Stalls	$2580 00
" " Tables	1639 00
" " Transient Dealers	154 75
	$4373 75

EXPENDITURES.

There has been expended from the appropriation for Repairs, etc., to Government Buildings $74.65. This amount was expended for whitewashing the market.

I again earnestly recommend that the new market building be made ready for immediate use, as the present building is unfit for use on account of its dilapidated condition.

Respectfully submitted,

ANDREW BROWN,

Clerk of Market.

REPORT

OF THE

BOARD OF FIRE COMMISSIONERS,

HONOLULU, DECEMBER 31, 1894.

—o—

J. A. KING, MINISTER OF THE INTERIOR:

SIR:—The Board of Fire Commissioners beg to hand you herewith their report for the nine months ending Dec. 31, 1894, together with the report of the Chief Engineer, covering the same period, to which you are respectfully referred for a detailed account of the Department expenditures, inventory of property, etc.

ORGANIZATION.

The Fire Department, as now constituted, consists of a Board of Fire Commissioners, who serve without compensation, a Clerk, the Chief Engineer, one Senior Foreman, one Foreman, two Engine Companies, one Hose Company, comprising in all a force of twenty-one uniformed men.

BOARD OF FIRE COMMISSIONERS.

Andrew Brown, Chairman.
Geo. W. Smith.
Hugh Gunn.

In view of the increased efficiency of the Department, and the need of still further increasing the number of companies to the number allowed by law,

the Commissioners would ask for an additional appropriation by the Councils for the sum of $4,000 for the unexpired period of two years, this sum to be used solely for the pay rolls of the Department.

The Commissioners would call particular attention to the following recommendations, which they deem of importance:

The urgent necessity of a suitable building for a Central Station, as well as for the proper housing of the apparatus and men, was never more apparent than at present. The present quarters are rapidly falling to pieces, are unhealthy and too small for the purpose required. Plans have been partially prepared by the Superintendent of Public Works for a new Central Station, on the Government property at the corner of Beretania and Fort streets. The cost of the building will be, as proposed, $25,000, which sum the Commissioners respectfully request will be appropriated for this purpose.

The placing of a fully equipped fire station in that portion of the city known as the "Plains," the great value of the improved property thereon, and the material of which most of the buildings are composed render this move one of imperative necessity.

The purchase of one hundred "three-way" hydrants would greatly facilitate rapidity of work at fires.

The Commissioners would also urge the passage of an act giving the Chief Engineer power to enforce the removal of rubbish heaps and other inflammable material carelessly placed in proximity to buildings. At the present time, there being no penalty for the neglect of this work, it is impossible to compel tenants to properly keep premises in a condition that will ob-

viate the dangers arising from ash heaps, old boxes, etc., now existing.

In conclusion, the Commissioners wish to express their confidence in the Chief Engineer and his associates in the department, and to recommend for your approval the various measures set forth therein.

Respectfully submitted,

A. BROWN,
Chairman.

OFFICE OF CHIEF ENGINEER, FIRE DEPARTMENT.

Honolulu, December 31, 1894.

ANDREW BROWN, ESQ.,
Chairman Board Fire Commissioners,

DEAR SIR:—In accordance with Act 17, Sec. 2, of the Provisional Government of Hawaii, I now present to you the report of the Department from April 1, 1894, to December 31, 1894.

During the third term a new addition was built to Engine House No. 1 for the accommodation of a single hose wagon and horse, with the requisite number of men, which will allow a full company to be stationed in the one building. The hose wagon is now completed, and carries two Holloway Extinguishers and six hundred feet of hose, which will add greatly to the efficiency of the Department.

FIRE ALARMS.

During the nine months there have been a total of twenty-eight alarms, as follows:

Explosion of kerosene oil lamps 4
Explosion of kerosene oil stoves 4

Defective smoke stacks	2
Spontaneous combustion	2
Smoking cigarettes	4
Rubbish	2
Grass	1
Unknown	6
Incendiary	2
Matches	1

FIRES ACCORDING TO WARDS.

WARD.	FIRES.	WARD.	FIRES.
1	0	9	0
2	0	10	0
3	5	11	0
4	5	12	5
5	5	13	0
6	1	14	0
7	1	15	3
8	3	16	0

LOSSES BY FIRE—INSURANCE PAID.

Total loss in twenty-eight fires	$7,250 00
Total loss paid	5,253 00
Total amount of insurance	6,550 00
Total amount not covered by insurance	750 00

COMPANY DRILLS.

Drills have been held regularly three or four times a week, which has been the means of making the men very efficient in making connections.

CONDITION OF APPARATUS.

The engines and other apparatus of the Department are in first-class serviceable condition.

BUILDINGS.

Engine Co. No. 1—Building is in good condition, the roof has been repaired and painted with fire and water-proof paint, and the outside of the building has been re-painted. An annex has been built to it for the accommodation of a hose wagon, which is fully equipped and always ready to accompany the engine to fires.

Engine house of Co. No. 5 is in good condition.

Engine house of Co. No. 2.—The Bell Tower premises are very old and in a tumble down condition, the roof had its shingles blown off in several places by the storms of last winter, leaving several portions of it entirely unprotected, thus allowing the rain to pour in, to the detriment of the apparatus and discomfort of the men.

The window frames are so badly worm-eaten that they cannot hold the sash, which are so far gone that the wind blows the lights of glass out of them into the streets, and the open space left in their places have no hanging blinds to cover them; and, as the sleeping apartments receive the water from the roof, in addition to exposure from the dilapidated condition of the windows the premises are so damp and unhealthy that sickness among the men is daily occurring.

The buildings are separating from each other, and are settling. This is caused by the foundations being almost rotted away.

The Hook and Ladder house, now used for storing the two spare engines, is in very bad condition. I consider these buildings to be dangerous and unsafe to occupy, and would urge your honorable body to give this matter your immediate attention.

APPROPRIATIONS AND EXPENDITURES.

Appropriations for actual requirements	$13,812 00
Appropriations for pay rolls	31,440 00
	$45,252 00

RECAPITULATION OF EXPENDITURES.

Pay rolls	$11,790 00
Apparatus (repairs)	612 71
House "	64 58
Horse feed	865 24
Horse shoeing	159 75
Harness and repairs	114 00
Fuel	72 25
Rent of houses	810 00
Telephone service	297 00
Veterinary service	33 00
Use of horse	41 00
Stationery and printing	55 50
Chemical Engine, 1 horse	225 00
Hose Cart, 1 horse	200 00
Stores and supplies	679 85
Extra labor	675 00
Sundries (gasoline engine and hack hire)	22 75
	$16,717 63
Balance of Appropriation Jan. 1, 1895	28,534 37

PAID OFFICERS AND MEMBERS OF THE HONOLULU FIRE DEPARTMENT.

NAMES.	POSITIONS.
Jas. H. Hunt	Chief Engineer.
Geo. Bailey	Senior Foreman.
Frank May	Foreman, Co. No. 1.

Wm. O. Barnhart...Engineer, Co. No. 1.
Geo. Kamaile.....Stoker, Co. No. 1.
Neal Boyle.....Driver, Co. No. 1.
Elia Hao.....Messenger, Co. No. 1.
W. H. Bromley....Engineer, Co. No. 2.
Chas. Valpoon.....Stoker Co. No. 2.
Thos. Morrissey.....Driver, Co. No. 2.
Joe. Sylva.....Messenger, Co. No. 2.
Gus. Morrissey.....Foreman Hose Co.
Gus. Carlson.....Horseman.
C. Orsman..... "
A. Strom..... "
J. Pigott..... "
J. Foster.....Driver Hose Cart.
T. K. Clark.....Horseman.
Chas. Chilltoe..... "
S. Stanford..... "
John Clark.....Hydrantman.

PROPERTY OF THE DEPARTMENT.

Engine Co. No 1. has in its charge the following property:

APPARATUS.

No. 3 Clapp and Jones Engine.....	1
No. of horses.....	2
Harness, double sets.....	1
Hangers.....	2
Hose, 2½ rubber, ft.....900	
Hose, ¾ rubber, ft.	50
Hydrant connection pipe, brass.....	1
Spanners, suction hose.....	4
" fire hose.....	6
Lanterns.....	13

Clocks	1
Chairs	6
Water filters	1
Horse blankets	2
Bedsteads, iron	7
Hose reels	1

ENGINE CO. NO. 2.

Engine, Double 80 Chemical	1
Horses	2
Harness, double sets	1
Hangers	2
Horse blankets	2
Hose, 2½ rubber ft	100
Hose, ¾ rubber, ft	100
Lanterns	6
Clocks	1
Chairs	18
Bedsteads, iron	17
Flagpole	1

SUPPLY WAGON.

APPARATUS.

Schencks' 2-horse Hose Wagon	1
Horses	2
Harness, double sets	1
Hangers	2
Extinguishers, Babcock's	2
Hose, 2½ rubber, ft	750
Spanners, hose	8
Lanterns	2

HOSE COMPANY.—APPARATUS.

Hose Carriage, four-wheeled 1
Horse 1
Harness, single sets 1
Hangers 1
Hose, 2½ rubber, ft.....600
Spanners, hose 6

VOLUNTEER COMPANY NO. 5.

The property belongs to said Company.

Apparatus—1 No. 2 Clapp & Jones Engine with hose reel and suction hose.

1 coal cart and all tools.

Government property at said house.

Rubber hose (new) feet.....600
Rubber hose (second hand) feet 400
Garden hose, feet..... 50
Lanterns and reflectors, large 1
Canvas cistern..... 1
Hook and ladder truck 1

SPARE APPARATUS.

Engines, Amoskeag (second class) 2
Reels, hose.....2

Each carrying 550 feet hose, always ready for work, and in first class order.

Truck, large hook and ladder 1

Ladders, etc., complete in good order, and stored at the Government warehouse.

New boilers 1
Jacket N. P.....1
Spare coils of copper 4

Grates, sets, all for second class Clapp & Jones' engine.

VIOLATION OF LAWS IN FIRE LIMITS.

August 10th.—One-story wooden building, erected by A. Gumpfert, on Queen street, and occupied by him as a stable.

August 15th.—One-story wooden building erected in rear of the Robinson block, on Hotel street, and occupied by Japanese as a kitchen.

Sept. 20th.—One-story wooden building erected on the Clark premises, Fort street, by Y. Lum Sing, and occupied by him as a stable and store room.

Since then no violations have occurred to my knowledge.

IN REGARD TO FIRES.

The city has been very fortunate in not having any large conflagrations during the past nine months. The only disastrous fire during said term was the burning of a blacksmith shop on King street, on the morning of June 17th, at 9:10, the fire being well under way when the Department was notified.

SERVICE OF THE CHEMICAL ENGINE.

During this term the services rendered by the Chemical Engine were most satisfactory, and especially of late when the water supply was short, I have had to rely entirely on the efficiency of the Chemical Engine. For instance, on Sept. 20th, at a fire on Queen street, opposite South, this engine gave such assistance alone that I cannot too highly appreciate its services for being the means of saving the adjoining buildings from destruction, as the water supply in that district was exhausted in a few minutes.

REMARKS.

I wish to extend my thanks to the Honorable Board of Fire Commissioners, and to the officers and members of the Department for their support during the term, and hope that our relations in the future will be as pleasant as the past.

Respectfully submitted,

J. H. HUNT,
Chief Engineer.

REPORT

OF

SUPERINTENDENT OF PUBLIC WORKS

—o—

BUREAU OF PUBLIC WORKS,
HONOLULU, DEC. 31, 1894.

J. A. KING, MINISTER OF THE INTERIOR:

SIR: Only nine months have passed since my last report and I will not attempt to give as full details as might be desirable, but considerable new work has been accomplished during this time under the Bureau of Public Works which deserves mention, besides the usual expenditures in the way of repairs and running expenses.

HONOLULU WHARVES.

Two new wharves have been constructed in the upper part of the harbor, taking the place of three old wharves which had been entirely outgrown by the shipping and which were removed.

Nuuanu street wharf west of Brewer's is 240 feet long and 80 feet wide, with a shed over it 200 by 48. This wharf is planked with four inch N. W. plank, coated with asphaltum and tarred paper, and then sheathed with two inch plank. Although the two

inch sheathing adds considerably to the first cost, it is thought it will save expense in the long run, as the sheathing can wear through without making the floor unsafe, and then be renewed, whereas the four inch plank by itself would require renewing when half worn through.

Sorenson's wharf is 200 feet long by 80 wide, finished with a block pavement made of 4x12 N. W. sawed in four inch lengths and laid on end over the four inch planking, which was first covered with asphaltum and paper. Each row of four inch blocks is separated from the next by a strip of 1x2 well nailed to the blocks, and the space above the strip filled with asphaltum and gravel rammed in. The experiment will be tried of covering the whole surface of this wharf with asphaltum and sand. This will prevent the rotting of the blocks and no doubt make a good wearing surface. There is no shed over this wharf.

The amounts expended on these wharves are as follows:

Removing old wharves	$ 328 95
Construction Nuuanu St. wharf	9,068 60
Construction Sorenson's wharf	11,130 56
Construction Pile Driver	266 59
Reconstruction of Sea-wall from Brewer's to Sorenson's wharves	510 45
Nuuanu St. wharf-shed	1,472 20
Mooring piles new steamer wharf	298 50
	$23,075 85

HONOLULU WATER SUPPLY.

Important additions to the Honolulu Water Works will consist of a complete pumping plant, artesian wells to supply the same, considerable additions to the street mains, and a reservoir on the slope of Punchbowl near the line of Alapai street.

Specifications were prepared for pipe and pumping plant, and advertised in San Francisco and New York as well as Honolulu. A large number of bids were received, and contracts were made as follows:

With the Honolulu Iron Works Co. for pump, boiler and smoke-stack, including foundations, erection, and connections complete;

With the McNeal Pipe and Foundry Co. for 6″, 8″, 12″ and 18″ pipe with special castings;

With Messrs. Holbrook, Merrill & Stetson of San Francisco, for valves and pig lead.

A contract has also been made with McCandless Bros. to drill two ten inch wells to supply the pump. A good location for the pumping station has been secured at the corner of Beretania and Alapai Sts. To complete the system and insure the pipes against the danger of excessive pressure from the pumps, it is very important that the discharge from the pump should be connected by a pipe of ample size, with a reservoir located as near as practicable to it. The reservoir will be on the slope of Punchbowl hill near the line of Alapai St., at an elevation of 170 ft. above the sea, which is a little higher than Makiki reservoir. The direct discharge will be into this reservoir, and as it fills, Makiki reservoir will also receive a portion.

In this connection it may be well to note that a similar reservoir on the slope of Diamond Head, and

and another back of Kalihi at about the same level, connected with the street mains will assist the service very materially. At the hours when little irrigation is going on the water will accumulate in these reservoirs, and when the greatest draft is made on the pipes they will be supplied from the extremities as well as the center.

As the pump is located on Beretania street the main artery of supply will naturally be along that street towards Punahou. A 12 inch pipe should be laid along Beretania to Makiki street and up Makiki to the reservoir, a total distance of 9300 feet. If not required to replace old pipe on Nuuanu street, a portion of the 12″ pipe ordered from the McNeal Pipe and Foundry Co. can be laid on this line.

INSANE ASYLUM WATER SUPPLY.

During the last summer the Nuuanu water supply diminished to such an extent that it became necessary to provide a special supply for the Insane Asylum. An artesian well was bored and a pump operated by a 16 ft. windmill connected to it. A redwood tank of 10,000 galls. capacity receives the discharge from the pump at an elevation of about 50 feet, and supplies the Asylum premises.

CURBING AND PAVING SIDEWALKS.

The sidewalk surrounding the Executive Building grounds has been curbed with native stone and greatly improved thereby.

ROADS AND BRIDGES.

A new road, including a covered bridge, has been made across the Hakalau gulch on Hawaii, and the bridges at Manalua and Pohakupuka in North Hilo have been reconstructed.

The volcano road was completed in September to the Volcano House, and the prison gang was then turned back and kept at work for the rest of the year repairing the road, which had become badly rutted in places, and filling up dangerous burrow pits along the lower part of the road.

A small gang has been at work repairing the "Peter Lee" road from Pahala towards the volcano, and another gang completing the road from Hilea to Pahala. It is proposed to construct a road passable for vehicles from the nearest point on this road to Punaluu.

Work has also been continued on the new road from Kailua running north towards the upper Government road. The grading is completed through the homestead lots in Kealakehe, but the lower part of the road has not been top dressed. This will be done, now that the road has reached a point where good material can be obtained.

On Molokai, the bridge at Waialua has been rebuilt, one span of 60 feet was made new, and the remaining 40 feet reconstructed from the old material.

On Oahu, a number of bridges in Koolauloa which have had very little attention for a number of years, have been put in order.

DREDGING HONOLULU HARBOR.

The suction dredger has been at work in the harbor a portion of the time, and it will be necessary to

continue this work, as the number of deep draught vessels coming to this port is constantly increasing.

REPAIRS TO WHARVES.

Extensive repairs have been made to the Pacific Mail wharf, Kinau wharf and O. S. S. wharf, constant repairs being also made to all of the wharves to keep them in order. The Oceanic wharf is being entirely replanked, and when this is finished, it will be some months before much repairing is necessary.

On Hawaii, repairs have been made to Hilo wharf, Laupahoehoe landing and Keauhou and Punaluu wharves. The buoy at Hilo has been taken up and thoroughly overhauled.

On Maui, Hana wharf has had extensive repairs, and a small amount has been expended at Lahaina.

On Kauai, Nawiliwili and Waimea wharves have had considerable repairs.

GOVERNMENT BUILDINGS.

A large amount of work has been done under the appropriations for Repairs and Furniture of Government Buildings. The Postoffice has been entirely rearranged and refitted inside; important changes have been made at the Police Station, giving much needed facilities to the Marshal's department; the old Custom House on Queen street has been fitted with new fire shutters, and minor repairs have been to a number of other buildings.

ELECTRIC LIGHT.

The expense of operating the Government Electric Light System has amounted to $435.25 per month,

besides the regular pay roll of $550 per month. This expense includes considerable new material and improvements, such as a new armature, suspension outfits for arc lights, etc. The number of arc lights operated from the Government Station at present is 102. There are also furnished without charge to various Government buildings 411 incandescent lights, besides 272 at reduced rates to the Queen's Hospital, Kaumakapili Church and the Hotel band stand.

There are at the present time eleven paying rates using 478 lights; the receipts being $247.65 per month. This makes the net cost of the 102 arc lights and 411 incandescent lights $737.60 per month.

Additional arc lights are very much needed. Fifty more could be placed on the streets of Honolulu to great advantage, but the water power is limited, being quite inadequate for even the present service during the dry months, and in order to carry more arc lights, either the power must be increased, or the incandescent lights discontinued.

NEW APPROPRIATIONS.

Although the appropriations made by the last Legislature will in most cases be ample to carry the work through the biennial period, I think it advisable to call your attention to the necessity for a few items.

WATER WORKS, HONOLULU.

As mentioned above, I think it very important that the 12-inch pipe should be continued along Beretania street and up Makiki to connect with the reservoir. An appropriation of $20,000 will cover this.

WATER WORKS, KOLOA.

The 3-inch wrought iron kalameined pipe which was laid at Koloa is giving out in many places owing to corrosive action of the water, and must soon be replaced; 5,500 feet of 3-inch pipe will be required which will cost laid $2,000.

WATER WORKS, LAUPAHOEHOE.

Certain repairs and additions to the Laupahoehoe Water Works seem advisable, and will require an appropriation of $300.

KING STREET BRIDGE.

It seems in keeping with other improvements which are being made in the city of Honolulu, that the old bridge on King should be replaced by a steel bridge the full width of the street. Unless the appropriation for Roads and Bridges, Honolulu, is sufficient to cover this, I would ask for $10,000 for this purpose.

COURT HOUSE, WAIOHINU.

I would ask you to consider the advisability of changing the appropriation of $3,500 made for Court House at Waiohinu, so that it can be used in Kona.

The District Judge in Kau and the Circuit Judge of Hawaii both expressed the opinion that the term of court held at Waiohinu would accommodate the public better if changed to Kona.

FIRE DEPARTMENT.

An appropriation of $6,000 has been made for a central fire station, with the proviso that it shall be made of brick. This provision practically forbids the

use of the appropriation, as it is impossible to construct a building of brick for that sum which will adequately meet the requirements of the fire department. With an appropriation, however, of $25,000 a building can be made of brick which will give the required accommodation, and will be a credit to the city.

Respectfully submitted,

W. E. ROWELL,
Superintendent of Public Works.

REPORT

OF THE

MINISTER OF THE INTERIOR.

—o—

DEPARTMENT OF THE INTERIOR,
HONOLULU, DEC. 31, 1894.

MR. PRESIDENT: In accordance with the requirements of Section 1, Article 35 of the Constitution, I have the honor to submit a report of the principal transactions of the Department of the Interior from the date of my last biennial report, March 31st to December 31st, 1894, covering a period of nine months.

The appropriations for this Department available from April 1st, 1894, together with the amounts drawn and balances, are summarized as follows:

SOURCE.	AMOUNT APPROPRIATED.	AMOUNT DISBURSED.	BALANCE. DEC. 31, 1894.
From Current Receipts	$1,046,042 96	$353,156 96	$ 692,886 00
From Loan Fund	489,359 59	73,175 17	416,184 42
Totals	$1,535,402 55	$426,332 13	$1,109,070 42

The important items of internal improvements included in the apropriations from Loan Funds with disbursements to date, are as follows:

ITEMS.	APPROPRIATION.	DISBURSED.	BALANCE DEC. 31, 1894.
New wharves, sea-wall, dredging Honolulu harbor and bar...	$120,500 00	$23,075 85	$ 97,424 15
Roads, Bridges and landings.....	100,650 00	10,823 86	89,826 14
New buildings, vaults, hospitals, etc	102,755 00	.....	102,755 00
Additions and improvements to waterworks.	130,500 00	26,669 28	103,830 72
Volcano road	9,035 13	9,005 61	29 52
Road damages	20,919 46	.....	20,919 46
Purchase of kuleanas at leper settlement.....	5,000 00	3,600 57	1,399 43
Totals.....	$489,359 59	$73,175 17	$416,184 42

The special deposit road tax balance to the credit of the several Road Boards March 31st, 1894, was.....	$29,493 09
Additional credits to December 31, 1894 ..	58,523 00
	$88,016 09
Drawn against this fund to Dec. 31, 1894 ..	37,069 31
Balance.....	$50,946 78

The Road Board for Honolulu (District of Kona, Island of Oahu) being abolished by Act 65 of the Provisional Government, the road taxes of the district are paid into the Treasury as a Realization, and a stated sum covering these receipts is appropriated for the

road work of the district, under the heading of Roads and Bridges.

The following is a statement of the amounts expended in the several districts for road purposes during the nine months ending December 31, 1894.

District.	Road Tax Fund.	Roads and Bridges Current.	Roads and Bridges Loan.	Total.
North Hilo	$ 654 25	$ 1,897 44		$ 2,551 69
Hilo	3,152 59	3,795 65	$ 5,000 00	11,948 24
Volcano Road			9,005 61	9,005 61
Puna	35 50			35 50
Kau	1,908 75	856 59	2,503 08	5,268 42
South Kona	482 35			482 35
North Kona	866 00		2,297 45	3,163 45
South Kohala	332 55			332 55
North Kohala	3,055 36			3,055 36
Hamakua	4,127 90			4,127 90
Lahaina	828 49			828 49
Wailuku	3,375 14			3,375 14
Makawao	1,867 90			1,867 90
Hana	1,016 90			1,016 90
Molokai	280 00	513 56		793 56
Lanai	100 00			100 00
Honolulu	1,602 12	45,146 71		46,748 83
Ewa and Waianae	1,188 54			1,188 54
Waialua	1,500 00			1,500 00
Koolauloa	1,177 56	687 05		1,864 61
Koolaupoko	2,268 91			2,268 91
Lihue	480 75			480 75
Koloa	1,333 00			1,333 00
Waimea	3,054 25			3,054 25
Hanalei	280 50			280 50
Kawaihau	2,100 00		1,023 33	3,123 33
Niihau				
Totals	$37,069 31	$52,897 00	$19,829 47	$109,795 78

DEPARTMENT RECEIPTS.

The receipts of this Department with its several bureaus for the nine months to December 31st, 1894, amounted to $178,543.87.

For the purpose of annual comparative statements in the future, the details of these receipts are here tabulated with those of the three previous months, making a complete statement for one year.

Receipts at Clerk's Office.	3 months to March 31, 1894.	9 months to Dec. 31, 1894.	Total for the year.
Licenses:			
Agents			
Alcohol		$ 50 00	$ 50 00
Auction and Tax	$ 70 53	1,316 51	1,387 04
Awa	1,023 00	3,674 00	4,697 00
Banking		500 00	500 00
Billiard	75 00	100 00	175 00
Boat	68 00	60 00	128 00
Boatman	11 00	25 00	36 00
Butcher, beef	600 00	940 00	1,540 00
" pork	300 00	720 00	1,020 00
Cake Peddling	150 00	700 00	850 00
Dray	35 00	137 50	172 50
Driver	74 00	256 00	330 00
Drug		160 00	160 00
Firearms	20 00	255 00	275 00
Hack	183 00	688 00	871 00
Horse			
Live Stock			
Livery Stable		200 00	200 00
Lodging-house	62 00	94 00	156 00
Merchandise	12,450 00	39,600 00	52,050 00
Milk	50 00	375 00	425 00
Physician	10 00	70 00	80 00
" Chinese		10 00	10 00
Public Show	535 00	905 00	1,440 00

Receipts at Clerk's Office	3 months to March 31, 1894.	9 months to Dec. 31, 1894.	Total for the year.
Licenses:			
Salmon	$ 110 00	$ 270 00	$ 380 00
Shipping	.....	.....	.....
Spirit — Wholesale	1,500 00	3,500 00	5,000 00
Spirit — Dealers	1,000 00	3,000 00	4,000 00
Spirit — Retail	4,000 00	15,000 00	19,000 00
Victualling	2,400 00	6, 500 00	8,900 00
Rents	14,737 19	42,764 48	57,501 67
Govt. Realizations	1,654 65	5,012 44	6,667 09
Laws, sales of	.....	28 00	28 00
Land office, fees	90 00	235 00	325 00
Land sales	4,483 48	9,899 27	14,382 75
" interest	299 25	416 85	716 10
Homesteads	2,988 87	3,427 41	6,416 28
" interest	1,833 36	1,711 96	3,545 32
Commutation	.....	.....	.....
Naturalization	.....	10 00	10 00
	$50,813 33	$142,611 42	$193,424 75
Receipts of various Bureaus:			
W[illegible] Honolulu	17 828 60	21 836 25	39 664 85

DETAILED STATEMENT OF GOVERNMENT REALIZATIONS, RECEIPTS OF INTERIOR DEPARTMENT.

Fees—		
Brands, Registry of		$ 66 00
Building Permits		435 00
Candidates—		
For Senators	$425 00	
For Representatives	425 00	900 00
Certificates, verifying documents		12 00
" in re-publishing of Newspapers		2 50
Charters, recording and amending of		120 90
Dis-incorporation		5 00
Patents of Invention, Caveats, Copyrights, Labels and Trade Marks		140 00
Permission to assign, Transfer and Mortgage Government Lease		15 00
Registry of Copartnership		25 50
Registry of Women trading in their own name		2 00
Sales—		
Animals, Government condemned		127 00
Buildings, Lumber and Fire-wood, old		1,292 25
Manure, soil, sand, coral, etc		544 50
Sundry old material		198 50
Sundry—		
Government survey, sale of maps, etc		147 50
Gunpowder storage		290 35
Royalty on guano taken from Pacific Islands		414 24
Ferry, Government, (receipts from)		55 70
Lahaina market, (rent of stalls)		188 00
Steam Roller, carts, prison labor, etc		30 50
		$5,012 44

AWA LICENSES.

The law regulating the sale of these licenses, fixes the limit in number and the upset price as follows:

Honolulu, 3, upset price, $500 each.
Hilo, 2, upset price. $300 each.
Lahaina, 2, upset price, $300 each.
Wailuku, 2, upset price $300 each.
All other districts, each 1, upset price, $100 each.

The law further provides that applications for such licenses for the ensuing year shall be made on or before the 1st of November of each year, and should there be more applications for any one district than the number allowed by law, the same shall be sold at auction.

In case of no application being filed for any one District within the limit of time allowed, the rule has been to not offer for sale nor allow any license for that District for the ensuing year.

There is no doubt that this practice has led to the selling of Awa either by licensees of the adjoining Districts, or to the sale by local cultivators without license and in either case to a loss of revenue to the Government.

It may readily be seen also that in Districts where two or more licenses are allowed by law, combinations may be formed and not only the number of licenses reduced to one, but the lack of competition would confine the amount of license fee to the upset price.

The following is a statement of the transactions in these licenses for the year 1895.

DISTRICT.	NUMBER OF APPLICATIONS	GRANTED TO APPLICANT	SOLD AT AUCTION.	RECEIPTS.
Hilo	1	1		$ 300 00
Puna				
Kau	1	1		100 00
South Kona				
North Kona	1	1		100 00
South Kohala	1	1		100 00
North Kohala	1	1		100 00
Hamakua	1	1		100 00
Lahaina	1	1		300 00
Wailuku	2	2		600 00
Makawao	1	1		100 00
Hana	2		1	96 00
Molokai & Lanai	1	1		100 00
Honolulu	1	1		500 00
Ewa & Waianae	2		1	105 00
Waialua	4		1	260 00
Koolauloa				
Koolaupoko	3		1	180 00
Lihue	2		1	280 00
Koloa	1			
Waimea	2		1	353 00
Hanalei	1			
Kawaihau	1			

There were no applications for Puna, South Kona or Koolauloa; consequently, no licenses were issued for those districts. The license for Hana sold for $101. From this the Deputy sheriff deducted $5 for expenses, leaving a balance as above of $96.

It will be seen from the above that of the three districts entitled to two licenses each, Wailuku was the only one from which two applications were received,

and they were both from the same party. Honolulu, entitled to three licenses, had only one applicant.

Referring to my report on this subject (page 171 Biennial Report, 1894), it will be seen that the receipts from this source have decreased rapidly during the past eight years. And while it may be conceded that the consumption of Awa has decreased, yet it could hardly be to an extent that would warrant so great a lack of competition in bidding for the privilege of its sale.

I would respectfully recommend that the Awa license law be amended, doing away with the application clause, and that one annual license be offered at auction for each district at a fair upset price, with the usual penalty for selling or furnishing without a license.

LAND OFFICE.

For the past year or two, requests, from prospective settlers on Government lands, for information in regard to the proper course to be pursued in the acquiring of said lands, have been very numerous and are continuing in increased number. In order to be in a position to readily answer such inquiries a compilation of the rules and regulations appertaining to the acquisition of the lands, as also a summary of the location and description of the various Government lands in the Republic, has been prepared by the clerk of the Land Office, and is herewith respectfully submitted.

MANNER OF ACQUIRING GOVERNMENT LANDS OTHER THAN HOMESTEAD LOTS.

Act 48 of the Laws of the Provisional Government, approved on the 25th day of August, A. D. 1893,

requires, that all sales and leases of Government lands shall be made at public auction.

BY PURCHASE.

There are two ways of acquiring Government lands by purchase.

1st. By Cash Payment.

2d. By Time Payments.

APPLICATION.

Every person desiring to acquire Government lands must file with the Minister of the Interior an application in writing, stating therein, in what manner he desires to acquire the land, i. e., whether by Cash Payment or by Time Payments; also stating where the land desired is situated, the area, and the proposed upset purchase price, either per acre or as a whole. The applicant must also guarantee, should he become the purchaser, to pay all expenses of surveying the land, if the same is unsurveyed.

All applications are docketted and referred to the Government Survey Bureau for report as to the advisability of disposing of the land applied for, the quality of the same; whether the upset price offered is a fair one, and if the land is surveyed.

Upon receipt of the Survey Office report the same is considered in the Executive Council, and if approved, the land is advertised for sale.

The applicant in all cases is informed in writing of the action taken on the application.

CASH PAYMENT.

When the land applied for is ordered to be sold and the terms are cash, the purchaser immediately

after the sale pays the purchase price, and a Grant conferring Fee Simple Title is issued to him. The cost of Grant including stamp is $6.00

TIME PAYMENTS.

The tracts applied for on Time Payments are sold on the following terms and conditions, viz.:

No person will be allowed to purchase more than one lot. One-fourth of the purchase price cash, and the remainder in equal installments in one, two and three years, with interest payable semi-annually at the rate of seven per cent. (7%) per annum.

Each purchaser shall begin substantial cultivation and improvement of his lot during the first year, and shall continue such cultivation through the succeeding two years.

At the end of the third year, if all the conditions have been performed by purchaser, he will receive a patent conferring fee simple title.

Failure to perform the full conditions shall work a forfeiture of right of possession or interest in the land.

In case of forfeiture, the land is to be sold at public auction by the Government, and if such sale results in an advance over the original price, the original purchaser is to receive therefrom the amount of his payments to the Government, on account of purchase, without interest, and a pro rata share in such advance in proportion to the amounts of his payments. If such sale result in a lesser price than the original, then the amount of payments returned to the party forfeiting, shall be charged with a pro rata amount of

such decrease proportioned to the amount of his payments.

An agreement shall be signed by each purchaser with the Government covering these conditions, and any assignment of such agreement shall work a forfeiture thereof. Each purchaser shall pay the cost of survey and plotting of the lots immediately after the sale together with the first installment of the purchase price.

AREA.

The acreage in locations adapted for coffee culture and other agricultural purposes, is limited to say fifty acres.

The acreage varies when a large tract is plotted out into lots. The size depending on the kind and quality of the land, and the number of lots deemed advisable to be laid out on the tract.

LEASES.

In order that Government lands may be obtained on lease, an application must be filed with the Minister of the Interior stating the area of the land, upset rental offered per annum, and the term of years required. (The longest term allowed is 15 years).

The application for leasehold takes the same course as in the case of applications for purchase.

AREA FOR LEASE.

The area of leasehold is entirely in the discretion of the Executive Council, as it is impossible under all conditions to limit the area for cane cultivation or other agricultural industries.

SURVEY.

In case the land applied for is unsurveyed, the lessee is to defray all expenses of plotting the same.

It would be advisable for proposed settlers to inspect personally or to make inquiries of some person located in the neighborhood of lands proposed to be acquired, before making formal application for purchase or lease.

The following gentlemen are named as reliable and suitable persons to apply to for information on this subject in their several neighborhoods.

HAWAII.

Hilo District.—A. B. Lobenstein, D. H. Hitchcock, E. W. Barnard.

Hamakua District.—Charles Williams.

Kohala District.—J. S. Smithies.

N. Kona District.—J. Kaelemakule, Geo. Clark,

S. Kona District.—J. W. Kuaimoku, W. J. Wright.

Puna District.—Robert Rycroft, J. W. Mason.

MAUI.

Kula District.—Geo. Forsyth, C. H. Dickey.

MOLOKAI.

Kalae.—R. W. Meyer.

KAUAI.

Hanalei.—A. S. Wilcox.

OAHU.

Government Survey Office.—J. F. Brown.

Land Office.—J. H. Boyd.

UNIVERSITY OF HAWAII
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LOCATION AND DESCRIPTION OF GOVERNMENT LANDS—ISLAND OF HAWAII.

HILO DISTRICT.

The total area of Government lands in this district is about 43,073.24 acres; nearly 3,100 acres are comprised in Homestead and other lots laid out for settlement, and about 7,000 acres lie in what may be called from its altitude in the cane belt, and there are about 10,000 acres in the coffee belt. The remainder is principally dense forest at high elevation.

The Homestead lots in this district are in great demand, and only a limited number of such lots remain for disposal. The appraised value of the same, ranges from $5 to $40 per acre.

The lands in the cane belt are at present mostly held under lease by sugar plantations, a very limited acreage remains undisposed of.

Government forest lands in this district suitable for coffee growing or for other agricultural purposes have been sold at public auction at $5 per acre.

HAMAKUA DISTRICT.

Total area of Government lands 252,610 acres. About 2,500 acres are within the cane belt, largely cultivated and held under lease by the sugar plantations; 3,500 acres are regarded as good coffee lands, a small portion of which is now held under lease to private parties; 3,436 acres (principally in the coffee belt) are Homestead lots, appraised at from $5 to $40 per acre, mostly taken up; 210,000 acres are regarded as grazing land including the great Kaohe tract; 20,174 acres are forest lands at higher elevation than at

present considered suitable for coffee cultivation, 13,000 acres, approximately are in the rugged and inaccessible tract to the north of Waimanu gulch.

The prices realized for coffee and agricultural lands in this district, sold at public auction, is the same as obtained for similar lands in the Hilo district.

KOHALA DISTRICT.

Total area of Government lands, 15,373 acres, classified as follows: 500 acres, cane land; 644 acres laid out for settlement; 500 acres, wood and coffee land, and about 13,729 acres adapted for grazing.

A large portion of the above is now held under lease by sugar plantations and ranchers.

NORTH KONA DISTRICT.

Total area of Government lands, 104,063 acres; about 1,744 acres of good coffee land not disposed of; 1,777 acres (principally in the coffee belt) are Homestead lots; appraised from 50 cents to $15 per acre, mostly taken up. 17,342 acres forest land at high elevation; 68,360 acres rocky grazing land, 14,840 acres barren lava.

A few acres of the grazing land are under lease to private parties.

SOUTH KONA DISTRICT.

Total area of Government lands, 24,444 acres; 540 acres good coffee land not disposed of; 789.94 acres (principally in the coffee belt) are Homestead lots appraised from $5 to $15 per acre. But few of these lots have been awarded. 8,149.06 acres forest land

at high elevation; 10,815 acres grazing land; 4,150 acres barren lava.

KAU DISTRICT.

Total acreage of Government lands, 101,716 acres; 883 acres are comprised in Homestead lots and are mostly taken up, 1,500 acres cane land under cultivation; 45,000 acres forest and mountain land, 54,333 acres rocky grazing land.

A portion of the forest and mountain land, also a small portion of the rocky grazing land are now under lease to sugar plantations and ranchers.

PUNA DISTRICT.

Estimated acreage of Government lands, 40,000 acres, of which there are 1,607 acres laid out in Homestead lots and are mostly all taken up; the remaining acreage varies widely in quality, from that of good arable land to barren lava.

ISLAND OF MAUI.

LAHAINA DISTRICT.

Total Government acreage, 659 acres, all grazing land not disposed of.

WAILUKU DISTRICT.

Total acreage of Government lands, 641.86 acres; 180.86 acres cane land; 461 acres grazing land, both of these tracts are under lease to sugar plantations.

HONUAULA DISTRICT.

Total acreage of Government lands, 14,484 acres,

all of which is rocky grazing land. This tract is at present under lease.

KULA DISTRICT.

Total acreage of Government lands, 13,321 acres. Of that amount 1,590 acres of the best land are Homestead lots, they are mostly taken up; the remainder, 11,731 acres, are grazing land now under lease to several parties.

HAMAKUAPOKO DISTRICT.

Total acreage of Government lands, 13,805.46 acres; 3,000 acres of that may be considered coffee land; the remainder 10,805 acres are mountain forest land. A portion of the above acreage is now under lease.

KOOLAU AND HANA DISTRICTS.

Total acreage of Government lands, 35,626 acres; 3,000 acres coffee land; 2,800 acres forest and mountain land; 29,826 acres grazing land. Portions of these tracts are under lease to several parties.

KIPAHULU, KAUPO AND KAHIKINUI DISTRICTS.

Total area Government lands, 34,072 acres; rocky and dry; a large area considered good grazing land. This tract is under lease to several parties.

ISLAND OF LANAI.

Total area Government lands, 30,347 acres; rocky and grazing land. This tract is under lease.

ISLAND OF KAHOOLAWE.

Total area Government lands, 30,000 acres; rocky and grazing land. This tract is under lease.

ISLAND OF MOLOKAI.

Total area Government lands, 14,005 acres, classified as follows: Dry grazing land, 13,594 acres; Homesteads, 322 acres, mostly all taken: Old fish pond, 89 acres. The dry grazing lands are undisposed.

ISLAND OF OAHU.

WAIKIKI.

Total area Government lands, 780.98 acres, comprising 729.98 acres rocky and kula land and 51 acres rice land. The rice land and portions of the kula land are under lease to various parties.

PALOLO.

Total area Government lands, 30.09 acres, 12 acres rice land and 18.09 acres kula land. These tracts are under lease.

MANOA.

Total area Government lands, 977.20 acres; 700 acres mountain tract; 277.20 acres grazing land. These tracts are under lease.

MAKIKI.

Total area Government lands, 1,200 acres; 178 acres laid out into building lots; 1,022 acres forest land reserved for Water Works.

NUUANU.

Total Government area, 220 acres grazing land. Reserved for Water Works.

KAPALAMA.

Total Government area, 28.20 acres; 10.50 acres adjoining railroad terminus; 17.70 acres, rice land. These tracts are now under lease.

KALIHI AND MOANALUA.

Total Government area, 915.53 acres; 2.53 acres, building lots; 171 acres, grazing, 742 acres, fish pond. These tracts are under lease to several parties.

EWA.

Total Government area, 2,635.45 acres; 2,630 acres grazing land, and 5.45 acres, rice land. These tracts are now under lease.

WAIANAE.

Total Government area, 3,648 acres; grazing and mountain land at present under lease.

WAIALUA.

Total Government area, 14,000 acres; rocky grazing and mountain land at present under lease.

KOOLAU.

Total Government area, 329.04 acres; 40 acres rice land, and 189.04 pasturage, at present under lease.

ISLAND OF KAUAI.

Total area Government lands, 22,056 acres; about 600 acres cane land now under lease to sugar plantations, 4,500 acres forest and mountain land, a few acres of which is suitable for coffee, 3,556 acres grazing land, 13,400 acres rugged inaccessible mountain tract.

Included in the above acreage is the famous village of Kalalau, which lies between two rugged and preciptious mountains northwest of said island; the lands of this vicinity are very fertile and suitable for agricultural purposes.

In the Hanalei district of this island is the valley of Waioli. This valley contains a limited acreage of land suitable for agricultural purposes, undisposed of.

LIST OF GOVERNMENT LEASES EXPIRING IN 1895 AND 1896.

ISLAND.	DISTRICT.	NO. OF LEASE.	LOCATION.	AREA.	DESCRIPTION.	EXPIRES.
Hawaii...	S. Kohala.	206	Puuanahulu.	Uusurveyed	Grazing.	Nov. 20, 1895
	Hamakua.	361	Hanapai.	77.75	Cane.	Oct. 14, 1895
	Hamakua.	360	Land between Kaiwiki	2,200	Cane.	Oct. 10, 1895
Maui.....	Honuaula.	350½	and Kaala.	1,054.54	Grazing.	Mar. 1, 1895
	Lahaina.	386	Kanahena.	.....	.....	May 15, 1895
Oahu	Honolulu.	175	Store House.	6,600 sq. ft	Town lot.	Jan. 1, 1895
		358	Lot in Honolulu.	2,200 sq. ft	Town lot.	Sept. 8, 1895
		400	Lot, Esplanade.	10,000 sq. ft	Town lot.	May 30, 1895
		401	Lots 64 & 65, Esplanade.	10,000 sq. ft	Town lot.	May 30, 1895
Hawaii. .	N. Kohala.	223	Lots 54 & 55, Esplanade.	Unsurveyed	Grazing.	Aug. 1, 1896
Maui.....	Hana.	362	Kahe.			
			Water hole at Kawai-	Unsurveyed	.....	Apr. 1, 1896
Oahu	Honolulu.	384	papa.	174½	Grazing.	June 2, 1896
			Alewa.			

REMARKS ON GOVERNMENT LAND MATTERS.

The Government during the nine months ending December 31, 1894, sold at public auction the following lands upon which fee simple titles were issued.

ISLAND OF OAHU.

One tract grazing land in Manoa containing 10.50 acres, amount realized, $560.

Three house lots at Kaluaopalena, Kalihi, containing 2,309 acres, $505.

One house lot at Nuuanu valley containing 7.25 acres, $1,000.

ISLAND OF HAWAII.

One tract of coffee land in Laupahoehoe, Hilo, containing 61.65 acres, $308.25.

One tract of dry grazing land at S. Kona, containing 15.3 acres, $126.

Two tracts of dry grazing land at S. Kona, containing 209 acres, $190.

One tract of coffee land in Paana and Awawaike containing 33.34 acres, $167.

One tract of coffee land in Paana and Awawaike containing 27.58 acres, $138.

ISLAND OF MOLOKAI.

Five tracts dry grazing land containing 870.45 acres, $730.

PURCHASE ON TIME PAYMENTS.

The method of acquiring land on time payments has met with general favor from persons of small means, who are desirous of obtaining homes upon favorable terms and conditions.

Upon this basis the Government disposed during the period mentioned of 19 lots in the Kaumana tract, Hilo, and one lot in Puualaea, N. Hilo, Hawaii.

All of the purchasers are making substantial cultivation and improvements on their lots, thus indicating a satisfaction with their holdings and an earnest desire to fulfill their agreements.

The Government has laid out several more lots to be disposed of on time payments in the district of Hilo, Hawaii, as follows:

4 lots at Kaumana.

4 lots at Kahoahuna.

2 lots at Paana.

7 lots at Laupahoehoe.

January 7, 1895, is the date fixed for the sale of the above.

In order that no waste shall be committed in the cutting down of growing trees on lands obtained upon time payments, I propose to insert a clause in the agreement to the effect "That no trees are to be felled unless the purchaser shall have received from the Minister of the Interior permission so to do. Applications for this privilege shall state the reason for cutting the trees, and if the Minister is satisfied, that it is for the improving of the holding, written permission may be granted. Only on the receipt of such written permission can trees be felled."

I further propose to insert in all time payment contracts, a clause, making it imperative at the end of each year for the purchaser to furnish the Government a sworn detailed statement of the extent of cultivation and the improvements made and the cost.

This will not only keep the Government informed

as to the value of improvement made by each p chaser on his holding, but also be an evidence t the purchasers are complying with the conditions their purchase.

LEASEHOLD.

There has been a marked decrease in the numb of applications for the leasing of Government lan and it can only be attributed to the general desire intending settlers to acquire lands by purchase preference to leasing.

MANNER OF ACQUIRING HOMESTEADS.

The Homestead Act "To consolidate and amen the law entitled An Act to Facilitate the Acquirin and Settlement of Homesteads," approved on the 9t day of January, 1893, authorizes the Minister of the Interior to cause portions of the public lands which are suitable for Homesteads purposes, and not at the time held by any person under lease from the Gov ernment, to be surveyed and laid out into lots not over twenty and not less than two acres in extent in dry or kula land, and not over two acres in extent in wet or kalo land, with convenient roads in connection therewith, provided, however, that in the district of Kahikinui and Kipahulu, Maui, and Kau, Kona and Puna, Hawaii, such lots may not be more than one hundred acres in area.

Upon the completion of such survey the Minister of the Interior appoints appraisers, who shall examine the lots so laid out and appraise the same, in their discretion, at a reasonable market rate, and shall report their appraisement to said Minister in a written statement signed by a majority of said appraisers.

ment enclose the lot with a substantial fence.

"He shall pay quarterly in advance a sum representing the quarterly interest of the purchase price of the lot at the rate of five (5%) per cent. per annum.

"At the end of the above term, he shall pay the purchase price in full or any part of the same that shall at that time remain unpaid.

"In case he is unable to pay the purchase price or the remaining balance, he shall deliver a mortgage of the premises to the Minister of the Interior to secure the payment of the amount due for a term not less than one year, nor more than ten years, at the rate of five (5%) per cent. per annum, payable semi-annually in advance.

"At the expiration of the term of ten years, and upon the full payment of the purchase price and the faithful performance of all the terms and conditions of the agreement, he shall receive from the Government a patent for his lot (except as provided in Section 6 of said Homestead Act. See below).

"In case he fails to perform any of the terms and conditions above set forth, the agreement shall become void, and the Government may, thereupon, without notice, demand, or legal process, take possession of the said premises, with the improvements that may be thereon, and remove him and all persons claiming under him and their effects therefrom.

"It is optional with him to pay the whole or any part of the purchase price before the termination of the term of ten years, and upon any such payment he shall be allowed a corresponding reduction of the amount of the interest money above stipulated.

In case of his death before the expiration of the term of ten years, all his rights and benefits in the

agreement shall vest in his heirs according to law, subject to the completion of the performance of the stipulations in the agreement.

"The agreement is not transferable.

"Nothing in the agreement is to be construed as giving him the right to impound live stock trespassing on the said premises until after he shall have fenced the said lot as required by law.

"The cutting and sale of ohia, koa, breadfruit and fruit bearing ohia trees growing upon such land is not permitted, except only so far as he may require portions of the land for immediate cultivation.

"Permission to put a substitute in his stead on the lot will be granted him by the Minister of the Interior, upon satisfactory reasons being giving.

"Section 6 of this Act authorises the Minister of the Interior to issue patents for such land as to the person purchasing the same after such party shall have built a suitable house, and shall have enclosed the land with a fence in accordance with law, and shall have paid the purchase price of such land together with the interest thereon, and that two-thirds of such land shall have been cleared and planted with fruit-bearing plants."

NUMBER AND LOCALITY OF HOMESTEAD LOTS UNASSIGNED DECEMBER 31ST, 1894.

ISLAND AND DISTRICTS.	TRACTS.	NO OF LOTS LAID OUT.	NO OF LOTS UNASSIGNED.
Hawaii			
Hamakua.	Kaapahu	40	3
Hilo.....	Kaiwiki	38	6
	Kahuku	16	2
	Kuaia, Paana, etc.....	39	12
N. Kona.	Kohanaiki, Hamanamana, Kalaoa & Ooma.	59	1
	Kaulana	86	1
S. Kona..	Olelomoana and Opihihali	12	7
	Kukuiopae	7	2
	Kalamakowali.....	7	3
Puna	Kaohe	16	5
	Nanawale	20	1
Kau....	Ninole and Wailau	55	17
Maui			
Kula ...	Waiakoa	52	10
	Pulehuiki & Kamehameiki	44	9
Molokai			
	Kamiloloa	9	9
	Hoolehua	10	4

HOMESTEAD LOTS.

This branch of the business of the Land Office has been steadily increasing during the term mentioned, only 92 lots remaining at present for disposal.

The receipts from this source has been as follows:

Amount paid in on account of purchase price for the nine months ending December 31, 1894	$3,427 41
Amount paid in on interest for the same term	1,711 96
Total Homestead Receipts	$5,139 37

By reason of continued non-compliance with the law and the rules and regulations made, the Government has been under the necessity of ousting several delinquent homesteaders who have failed to comply with the terms of their agreements, by cancelling the contracts and reawarding the lots to other applicants.

These necessary and forced examples have had due effect upon such homesteaders as were inclined to be backward in paying the interest, neglectful in making improvements and not living on their lots. All delinquents are now endeavoring to make up for lost time, and the present occupiers of Homesteads are fully awake to the fact that there are a number of progressive, industrious people in this country who are only too willing to take up holdings should those now in possession fail to conform to their agreements with the Government.

In the event of additional tracts of Government lands being plotted for Homestead purposes, I would suggest that the law be so amended as to provide that upon the cancellation or surrender of any Homestead agreement, the lot therein mentioned may be again applied for and awarded, provided, the party so applying will agree to pay a fair valuation on the improvements made on said lot. Such valuation to be made by the Minister of the Interior.

Upon the receipt of the amount of the valuation mentioned above, the Minister of the Interior to be authorized to deduct the amount of interest due to the Government up to the date of the cancellation or surrender of said agreement, the balance to be paid over to the party whose agreement has been cancelled.

All Homesteaders shall be required to make annual

reports to the Minister of the Interior of the area tivated and cost, and the improvements made cost thereof, until such time as they shall have fected their title. Upon the receipt of these repc the Minister of the Interior shall have the same en ed in a record to be kept for that purpose.

PATENT RECORDS.

An important duty in connection with the work the Land Office is the care and custody of the recori of title upon which land owners hold their propert in fee.

There are three classes of Patent Records, i. e.:

1. Upon confirmation of award by the Land Com mission, granting absolute fee simple title.

2. Upon confirmation by the Land Commission, granting an estate of freehold less than allodial, and

3. Upon cash sales, granting absolute fee simple title.

These records are in constant use by parties making abstracts of titles and for information in regard to boundaries. In this connection it is deemed proper to state that from these continuous examinations and handling, and from the age of many of the earlier records, a number of volumes have been several times rebound, and it is feared that these repairs will not be equal to the strain that will be placed upon them for continued use. It is very important that copies of these records be made for constant use, and the originals be filed away to be use only for reference.

I would therefore recommend an early appropriation for this purpose.

Some years ago is was found necessary to make

in his last biennial report.

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	No. of Shares.	Par Value.	Amendments.		
						Present Capital Stock.	Present No. of Shares.	Par Value.
Haiku Sugar Co	1858, Nov. 20	50	$50,000	50	$1,000	$750,000	7,500	$ 100
Kohala Sugar Co	1863, Feb. 3	*25	40,000	80	500	480,000	960	500
Princeville Plan. Co	1875, Sept. 15	20	120,000	120	1,000	240,000	2,400	100
Wailuku Sugar Co	1875, Sept. 15	(.)20	90,000	180	500	500,000	5,000	100
Haw. Agricultural Co	1876, Dec. 22	30	120,000	240	500	500,000	5,000	100
Hon. Iron Works Co.	1876, Dec. 22	20	100,000	200	500	200,000	2,000	100
Kapiolani Park Asso	1876, Dec. 22	30	5,000					
Makee Sugar Co	1877, Apr. 30	30	160,000	1,000	1,000	500,000	5,000	100
Haw. Telegraph Co	1878, Mar. 4	30	3,000					
Waimanalo Sugar Co	1878, Apr. 15	50	180,000	1,800	100	500,000	5,000	100
Honokaa Sugar Co	1878, May 8	†15	200,000	100	2,000	200,000	2,000	100
Koloa Sugar Co	1878, Sept. 6	50	200,000	200	1,000			
Ookala Sugar Co	1879, Mar. 4	30	100,000	100	1,000	200,000	2,000	100
Waihee Sugar Co	1879, June 24	50	200,000	200	1,000			
Pacific Sugar Co	1879, Aug. 19	50	100,000	200	500	300,000	3,000	100
Kilauea Sugar Co	1880, Jan. 31	50	300,000	300	1,000			
Haw. Railroad Co	1880, July 5	50	1,000,000	2,000	500			

*Term extended for 50 years from Feb. 3, 1888. (.) Term extended to 50 years. †Term extended for 50 years from May 8, 1893.

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING, PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.—*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	No. of Shares.	Par Value.	Amendments.		
						Present Capital Stock.	Present No. of Shares.	Par Value.
Kauai Telephone Co. . .	1880, Oct. 2	50	$ 10,000	1,000	$ 10	$20,000	2,000	$ 10
Waianae Co.	1880, Oct. 15	50	170,000	1,700	100	255,000	2,550	100
Haw. Bell Tel. Co.	1880, Dec. 30	50	10,000	1,000	10	50,000	5,000	10
Union Mill Co.	1881, Mar. 30	50	160,000	160	1,000	. . . . .	. . . . .	. . . . .
Olowalu Co	1881, May 5	50	150,000	1,500	100	. . . . .	. . . . .	. . . . .
Kahului Railroad Co . .	1881, July 1	50	75,000	150	500	150,000	1,500	100
Planters' L. & S. Co. . .	1882 Mar. 20	50	125,000	25,000	5	. . . . .	. . . . .	. . . . .
Hilo & Haw. T. & T Co .	1882, Mar. 20	50	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .	. . . . .
Onomea Sugar Co.	1882, Oct. 20	50	225,000	22,500	10	500,000	5,000	100
Paukaa Sugar Co	1882, Oct. 20	50	170,000	17,000	10	. . . . .	. . . . .	. . . . .
C. Brewer & Co.	1883, Feb. 7	50	500,000	5,000	100	600,000	6,000	100
Reciprocity Sugar Co. .	1883, Feb. 7	50	60,000	600	100	250,000	2,500	100
Inter-Island S. N. Co. . .	1883, Feb. 7	50	300,000	3,000	100	425,000	4,250	100
Paia Plantation.	1883, June 19	50	750,000	7,500	100	. . . . .	. . . . .	. . . . .
Hamakua Mill Co.	1883, June 19	50	240,000	2,400	100	. . . . .	. . . . .	. . . . .
Laupahoehoe Sugar Co.	1883, June 19	50	600,000	6,000	100	. . . . .	. . . . .	. . . . .
E. O. Hall & Son.	1883, July 13	50	200,000	2,000	100	. . . . .	. . . . .	. . . . .

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.—*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	No. of Shares.	Par Value.	Amendments.		
						Present Capital Stock.	Present No. of Shares.	Par Value.
Waikapu Sugar Co. . . .	1883, July 13	50	$ 250,000	2,500	$ 100	.....	.....	.....
Honomu Sugar Co . . .	1883, Aug. 10	50	200,000	2,000	100	$250,000	2,500	$ 100
Mutual Telephone Co. .	1883, Aug. 16	50	30,000	3,000	10	150,000	15,000	10
Alden Fruit & Taro Co.	1883, Aug. 27	50	50,000	500	100	.....	.....	.....
Haw. Carriage Mfg. Co.	1883, Oct. 9	50	75,000	750	100	45,000	450	100
Humuula Sh'p Stat. Co.	1883, Oct. 30	50	100,000	1,000	100	.....	.....	.....
Pacific Navigation Co.	1883, Nov. 14	50	150,000	1,500	100	.....	.....	.....
Wilder's Steamship Co.	1883, Nov. 14	50	400,000	4,000	100	500,000	5,000	100
Puuloa Sheep and Stock Ranch Co.	1883, Nov. 15	50	60,000	600	100	.....	.....	.....
Hawaiian Stone Co. . . .	1883, Nov. 15	50	10,000	100	100	.....	.....	.....
Hawaiian Cable Co. . . .	1884, Jan. 21	50	200,000	2,000	100	.....	.....	.....
Kawailoa Ranch Co. . .	1884, Feb. 25	50	100,000	1,000	100	.....	.....	.....
Woodlawn Dairy and Stock Co	1884, Feb. 25	50	42,500	425	100	100,000	1,000	100
Daily Hawaiian	1884, Mar. 20	50	100,000	10,000	10	.....	.....	.....
Waimea Sugar Mill Co.	1884, Aug. 19	50	70,000	700	100	.....	.....	.....
Hutchinson Plant'n Co.	1884, Sept. 11	50	1,000,000	10,000	100	.....	.....	.....

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.—*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	No. of Shares.	Par Value.	Amendments.		
						Present Capital Stock.	Present Number of Shares.	Par Value.
Hilo Sugar Co	1884, Sept. 11	25	$ 250,000	2,500	$ 100	$500,000	5,000	$ 100
Pacific Hardware Co...	1885, Jan. 31	50	200,000	2,000	100	.....	.....	.....
Union Feed Co.....	1885, Jan. 30	25	50,000	1,000	50	75,000	1,500	50
Hawaiian Ramie Co...	1885, Jan. 31	50	60,000	600	100	.....	.....	.....
Kukaiau Plantation Co.	1885, Jan. 31	50	120,000	1,200	100	.....	.....	.....
Press Publishing Co ..	1885, Jan. 31	50	20,000	800	25	.....	.....	.....
People's Ice & Ref'g Co.	1885, Jan. 31	50	120,000	1,200	100	150,000	1,500	100
Haw. Gazette Co ...	1885, Jan. 31	50	30,000	300	100	40,000	400	100
Pacific Com. Advertiser.	1885, Mar. 11	50	30,000	300	100	.....	.....	.....
Mokaenui Sugar Co ...	1885, Mar. 13	25	120,000	12,000	10	.....	.....	.....
Heeia Agricultural Co..	1885, Oct. 17	50	150,000	1,500	100	.....	.....	.....
Royal Haw. Hotel Co..	1885, Nov. 19	20	75,000	1,500	50	.....	.....	.....
Waiohinu Agricultural and Grazing Co.....	1886, Nov. 6	50	15,000	150	100	.....	.....	.....
Kipahulu Sugar Co....	1887, Jan. 17	50	80,000	800	100	.....	.....	.....
Hawaiian Mer'tile Co..	1888, Feb. 27	50	20,000	200	100	.....	.....	.....
Kohala Telephone Co..	1888, Feb. 27	50	10,000	1,000	10	.....	.....	.....
Haw. Fruit & Taro Co.	1888, Sept. 27	50	30,000	1,500	20	.....	.....	.....

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.—*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	Number of Shares.	Par Value.	Amendments.		
						Present Capital Stock.	Present Number of Shares.	Par Value.
Haleakala Ranch Co. . .	1888, Sept. 1	50	$ 120,000	1,200	$ 100	$220,000	2,200	$ 100
Oahu Railway & Land Co	1889, Feb. 4	50	700,000	7,000	100	.....	.....	.....
Hawaiian Hardware Co	1889, Mar. 30	50	75,000	750	100	.....	.....	.....
Elele Publishing Co. . . .	1889, April 2	50	10,000	2,000	5	.....	.....	.....
Maui Telephone Co. . . .	1889, April 25	50	7,000	700	10	10,000	1,000	10
Waiakea Mill Co	1889, April 25	50	300,000	3,000	100	.....	.....	.....
Hanalei Sugar Mill Co .	1889, May 29	11	50,000	500	100	.....	.....	.....
Union Ice Co.	1889, June 20	50	30,000	300	100	.....	.....	.....
Hamakua and S. Kohala Telep'ne and Tel. Co.	1889, June 20	50	7,500	300	25	.....	.....	.....
Pacific Cable Co.	1889, July 3	50	1,000,000	10,000	100	.....	.....	.....
Hui Kalepa Hawaii. . . .	1889, July 25	50	15,000	1,500	10	.....	.....	.....
Kona Sugar Co	1889, Aug. 24	50	600,000	.....	.....	.....	.....	.....
Pepeekeo Sugar Co. . . .	1889, Oct. 14	50	750,000	7,500	100	.....	.....	.....
Hawaiian Sugar Co. . . .	1889, Oct. 30	50	2,000,000	20,000	100	.....	.....	.....
Haw. Pacific Cable Co. .	1889, Nov. 15	50	100,000	1,000	100	.....	.....	.....
Ewa Plantation Co. . . .	1890, Jan. 29	50	500,000	5,000	100	750,000	7,500	100
Kahuku Plantation Co. .	1890, Jan. 30	50	500,000	5,000	100	.....	.....	.....

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS. —*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	Number of Shares.	Par Value.	Amendments. Present Capital Stock.	Present Number of Shares.	Par Value.
Union Iron Works Co.	1890, Mar. 1	50	$ 50,000	500	$ 100	$ 150,000	1,500	$ 100
Campbell, Marshall Co	1890, Mar. 22	50	100,000	1,000	100	.....	.....	.....
Hawaii Land Co.....	1890, Apl. 3	50	10,000	1,000	10	.....	.....	.....
Hilo Soda Works Co.	1890, May 23	50	5,000	50	100	.....	.....	.....
Honolulu Dairy Co..	1890, May 23	50	20,000	200	100	.....	.....	.....
*Pacific Guano & Fertilizer Co.....	1890, May 23	50	100,000	1,000	100	200,000	2,000	100
Pioneer Building & Loan Association .	1890, June 12	50	300,000	1,500	200	1,000,000	5,000	200
Hui Kalepa o Pauwela	1890, July 16	50	1,500	300	5	.....	.....	.....
W. G. Irwin & Co...	1890, July 24	50	500,000	5,000	100	.....	.....	.....
Paauhau Plantation Co	1890, July 24	50	1,000,000	10,000	100	.....	.....	.....
Daily Bulletin Pub. Co	1891, Sept. 26	50	15,000	150	100	.....	.....	.....
Hawaiian Abstract & Title Co.....	1891, Dec. 1	50	10,000	100	100	.....	.....	.....
Haw. Star Newspaper Association	1893, Mar. 25	50	10,000	1,000	10	.....	.....	.....

*Originally North Pacific Phosphate and Fertilizer Company.

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.—*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	Number of Shares.	Par Value.	Amendments. Present Capital Stock.	Present Number of Shares.	Par Value.
M. S. Grinbaum & Co..	1891, Jan. 31	50	$ 300,000	3,000	100	.....	.....	.....
Kona Coffee & Fruit Co	1891, Feb. 2	50	25,000	2,500	10	.....	.....	.....
Haw. Coffee & Tea Co...	1891, Feb. 3	50	60,000	600	100	$ 80,000	800	$ 100
Kilauea Vol. House Co.	1891, Mar. 19	50	50,000	2,000	25	55,000	2,200	25
Fashion Stable Co.....	1891, Apl. 3	50	40,000	400	100	60,000	600	100
Haw. Construction Co..	1891, Apl. 4	50	500,000	5,000	100	.....	.....	.....
Haw. Holomua Pub. Co	1891, June 27	50	2,000	400	5	.....	.....	.....
Haw. News Co.....	1891, Aug. 11	50	25,000	250	100	.....	.....	.....
Pearl City Fruit Co....	1891, Aug. 19	50	25,000	250	100	.....	.....	.....
*Hobron, Newman & Co	1891, Sept. 25	50	8,000	80	100	30,000	300	100
Haw. Electric Co.....	1891, Oct. 13	50	20,000	200	100	150,000	1,500	100
Woodlawn Fruit Co....	1891, Oct. 20	50	30,000	300	100	.....	.....	.....
Club Stables Co.....	1891, Dec. 4	50	25,000	250	100	.....	.....	.....
Haw. Pork Packing Co.	1892, Mar. 12	50	22,500	225	100	.....	.....	.....
Haw. Fishing Co.	1892, July 18	50	25,000	250	100	.....	.....	.....
Lihue Plantation Co..	1892, Sept. 8	50	700,000	7,000	100	.....	.....	.....
Macfarlane & Co	1892, Oct. 11	....	60,000	600	100	.....	.....	.....
Haw. Fruit & Packing Co	1892, Oct. 15	50	40,000	400	100	.....	.....	.....

*Amended to Hobron Drug Company, August 14th, 1894.

LISTS OF CORPORATIONS FOR MERCANTILE, AGRICULTURE, MANUFACTURING PURPOSES NOW IN EXISTENCE, CHARTERED UNDER THE LAWS OF THE HAWAIIAN ISLANDS.—*Continued.*

Title of Corporation.	Date of Charter.	Term of Years.	Original Capital Stock.	Number of Shares.	Par Value.	Amendments.		
						Present Capital Stock.	Present Number of Shares.	Par Value.
Kilauea Cyclorama Co.	1892, Nov. 10	50	$82.000	820	$100	$83,000	830	100
Maui Fisheries Co	1892, Nov. 22	50	10,000	500	20			
Hon. Soap Works Co	1893, Jan. 11	50	25,000	250	100			
Kona Coffee Co	1893, Oct. 30		50,000	1,000	50			
Maui land & Railroad Co	1894, Jan. 2	50	20,000	800	25			
Hollister Drug Co	1894, Feb. 21	50	50,000	500	100			
Haw. Exhibition Co	1894, Mar. 9	50	50,000	500	100			
Tropic Fruit & Fiber Co	1894, May 10	50	50,000	500	100			
Con'd S. Water Works Co	1894, June 1	50	33,000	330	100			
Holomua Publishing Co	1894, June 1	50	8,000	80	100			
Theo. H. Davies & Co.	1894, June 29		900,000	9,000	100			
Estate of S. G. Wilder	1894, Oct. 4	50	560,000	5,600	100			
S. G. Wilder & Co	1894, Oct. 4	50	50,000	500	100			
Wilder & Co	1894, Oct. 4	50	100,000	1,000	100			
Kaneohe Ranch Co	1894, Nov. 13	50	60,000	600	100			
Hilo Electric Light Co	1894, Dec. 5	50	10,000	100	100			
Haw. Land & Im. Co.	1894, Dec. 10	50	25,000	250	100			
Castle & Cooke	1894, Dec. 29	50	600,000	6,000	100			

IMPORTATION AND INSPECTION OF LIVE STOCK FOR NINE MONTHS ENDING DECEMBER 31ST, 1894.

PORT OF ARRIVAL.	FROM.	STALLIONS.	MARES.	GELDINGS.	MULES.	BULLS	COWS.	SWINE.	SHEEP.	DOGS.
Honolulu	San Francisco	2	37	41	151		4	*1,423		7
	British Columbia		5	6	4	16	32			
	Great Britain							3		
	Japan							4		2
	Australia								†14	
		2	42	47	155	16	36	1,430	14	9
Kahului	San Francisco		2					2		2
Hilo	San Francisco		6	7	86		6			
	Totals	2	50	54	241	16	42	1,432	14	11

* For slaughter. † 11 for slaughter.

ELECTION EXPENSES.

The sum ($10,000) appropriated for Expenses of Election, has been found insufficient to pay the requirements of the Board of Examiners for Special rights of citizenship, registration of voters and of the Special Election of October 29th, 1894.

The disbursements to Dec. 31st amounted to $9,760.64, and there is still due and unpaid as follows:

Boards for Maui, Molokai, etc.....	$1,164 33
Boards for Kauai and Niihau.....	888 00
Sundry printing.....	45 00
	$2,097 33

The appropriation balance is only $239.36, and as the outstanding claims should be promptly met, I would respectfully recommend as additional appropriation for Expenses of Election at an early date amounting to at least $5000. This would enable the Department to meet the expense of filling any vacancy which might occur prior to the passage of new appropriations.

AGRICULTURE AND FORESTRY.

The report of the Commissioner of Agriculture gives evidence of much good work in that comparatively new but important bureau.

The importation and distribution of valuable plants and seeds is steadily increasing, and special endeavor is made to import such varieties of fruit and timber trees and such fibre and other plants as it is hoped may prove to be adapted to our climate, and may increase our list of valuable paying products and industries.

Much care has also been given to the introduction of beneficial insects to prey upon the several forms of blight, which have obtained a foothold and have proved a troublesome and destructive pest in some districts of the Islands.

It must be remembered that the efforts of this bureau are as yet in the experimental stage, and some of them may prove to be failures; but a great majority of these introductions cannot fail to become of permanent value.

An opportunity is now offered at little or no expense, for those who have land available, and who are interested in such matters, to aid in increasing the diversified industries of these Islands, and in advancing their own prosperity as well.

The bureau earnestly invites the co-operation of land-holders and will gladly furnish plants and seeds, only asking in return that the same may receive proper care and attention.

The report will be found interesting, and will well repay a careful perusal.

INSANE ASYLUM.

Under the provisions of Act 78 of the Provisional Government, approved June 1st, 1894, the management and control of the Insane Asylum, so far as relates to the maintenance, care and discharge of patients, was transferred from the Minister of the Interior to the Board of Health, and the report of the Medical Superintendent of that Institution will hereafter be included in the transactions of that Board.

HONOLULU WATER SUPPLY.

For some years past, the steadily increasing demand for water to supply Honolulu and its suburbs, and the frequent failure of our main source of supply in Nuuanu valley, has been a matter for serious consideration by the Government.

As far back as 1884 and 1886, elaborate surveys and reports on proposed systems of water storage in the upper valley were carefully considered, but from one cause or another no definite action was taken beyond increasing the number of reservoirs; and as none of these were arranged for permanent storage, the surplus, in times of plenty, ran to waste, and there being no reserve to draw upon in time of drought, the threats of a water famine became a matter of annual recurrence.

At times a large portion of the city has suffered for want of a sufficiency for household purposes, and recourse was had to the expensive and unsatisfactory method of forcing water into the mains from artesian wells by means of the steam engines, belonging to the Fire Department.

During the months of August, September and October, 1893, Honolulu suffered severely for want of a sufficient water supply, and the want was only partially relieved by connecting one of the powerful steam fire engines to the artesian well at Thomas Square, and pumping directly therefrom into the Beretania street main. Meanwhile, work was commenced upon cleaning the artesian well near the Makiki Reservoir and the erection of a pump to bring the water to the surface, a height of 120 feet. A contract was made with the Honolulu Iron Works for a triple

cylinder, single acting brass pump with the necessary engine and fittings. This well had been enlarged to the water level and bricked up to the surface. The pump was set at the bottom of the bricked well, and a ladder was constructed leading from the top of the well to the pump. The machinery at the surface was protected by a substantial building. The whole plant was completed ready for service October 31st, 1893, at a cost of not quite $4,500, excepting the boiler, which was furnished by the Government from the former Palace electric plant.

Upon testing the working capacity of this plant, the pump discharged 1,500,000 gallons into the reservoir in twenty-four hours.

Early in May, 1894, the water supply again failed, and it became necessary to put the Makiki pump into active and steady service, and so well did it perform its work, giving a good supply to the water front, the plains of Kulaokahua and Waikiki, that it seemed to point to a pumping plant as the proper solution of our water problem, and the Government determined to adopt the recommendations contained in the reports of the Superintendent of Water Works and of this Department for the last biennial period. Calls for tenders for a pumping plant and for a supply of water pipe and fittings were widely advertised, and after careful consideration, contracts were made as follows:

PIPE AND CONNECTIONS.

September 11, 1894. The McNeal Pipe and Foundry Co., Burlington, New Jersey.

18-inch pipe, 156 feet.

12-inch pipe, 10,400 feet.

8-inch pipe, 10,800 feet.
6-inch pipe, 5,000 feet.
Connections (say) 8 tons.
This contract will amount to about $22,800.

GATES AND LEAD.

October 3d, 1894. With Holbrook Merrill & Stetson of San Francisco, for 19 Chapman water gates, 28.000 pounds pig lead. Amount of contract, $1,564.83.

PUMPING PLANT.

October 11, 1894. With the Honolulu Iron Works Co. To furnish and erect a complete Blake Pumping Plant with a guarantee for two years. Pumping engine to be of a capacity to deliver 100,000 U. S. gallons water in one hour against 70 pounds per square inch domestic pressure. The contract calls for the completion and delivery of the plant in working order on the 31st day of May, 1895. Amount of contract, $30,500.

ARTESIAN WELLS.

December 17th, 1894, McCandless Bros. To drill two artesian wells on the lot at corner of Alapai and Beretania streets (the site selected for the erection of the pumping plant.) The wells each to be 10 inch diameter inside of the casing, to be sunk into the bed rock from 75 to 125 feet at the option of the Minister of the Interior. The casing to be ⅜ inch, and to be driven to bed rock and cemented. Both wells to be completed by May 1st, 1895, Contract, $8 per foot.

I estimate that $10,000 will cover the cost of these two wells.

BUILDING AT PUMPING STATION.

It is estimated that the cost of a brick building to enclose the pumping plant will be about $6,000.

COST OF LAYING MAINS

and the cost of laying the new mains making the necessary connections for consumers and lifting the old mains will be, say $9,000, or a total expenditure upon the original estimates of $79,864.83.

There are a few needful requirements to complete this important system, and which were not considered in the original estimates. These are as follows:

A 12-inch main running along Beretania street from the pumping station and connecting with the Makiki reservoir; the 8-inch main on this section to be taken up and relaid on King street, between Nuuanu street and the Waikiki road.

A reservoir to be constructed on Punchbowl hill on a line with Alapai street and connecting by an 18-inch pipe directly with the pumping station.

Fifty additional standing fire hydrants.

An appropriation for running expenses of the pumping plant.

These items have had the careful consideration of the Superintendent of Public Works and the Superintendent of Water Works, and are embodied in their reports with estimates of costs.

Upon the completion of this important work, I feel assured that not only will it prove to be a valuable investment for purposes of revenue; but for health, comfort, cleanliness and protection from fires, Honolulu will have attained a most enviable position, so

far as concerns the matter of a plentifuly supply of pure water.

HONOLULU FIRE DEPARTMENT.

The Board of Fire Commissioners in their Report, ask for an additional appropriation of $4,000,—for Pay Rolls for the unexpired period of two years. This will enable them to put into service an additional company and equip the spare engine, an amoskeag (second class.)

The Board also urge the necessity of providing at an early day a suitable building for a Central Station, for which purpose they ask for an appropriation of $25,000.

The premises at present in use are under lease to the Government at a rental of $1,080 per annum. The buildings are in an unsafe condition and entirely unfitted for the safe keeping of the apparatus and storage of supplies; while the Government are in possession of a site which was purchased for this purpose and which is ample for all requirements.

There is appropriation item of $6,000 for the building of a Central Fire Station.

I am satisfied after careful consideration of the matter that a properly equipped Central Station cannot be built for less than the amount named by the Board.

A glance at the premises at present in use as a Central Station is evidence that the statement of its bad condition is not overdrawn in the report of the Chief Engineer to the Commissioners.

I therefore earnestly recommend that the item of $6,000 for a Central Fire Station be increased to

$25,000, and also an addition of $4,000 be added to the appropriation for Pay Rolls.

PUBLIC WORKS.

The Superintendent of Public Works in his Report, hereto annexed presents a statement in detail of the work done under his supervision during the past nine months, with recommendations for additional Improvements in the near future.

I have the honor to be, Sir:

Your Obedient Servant,

JAMES A. KING,

Minister of the Interior.

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Hawaiian Islands. Minister of the Interior Report

REPORT

OF THE

MINISTER OF THE INTERIOR.

DEPARTMENT OF INTERIOR.

MR. PRESIDENT:

In accordance with the requirements of Section 1, Article 35 of the Constitution, I have the honor to submit a report of the principal transactions of this Department during the twelve months ending December 31, 1895.

APPROPRIATIONS.

The following is a summary of the appropriations made available for this Department for the Biennial Fiscal period ending March 31st, 1896; showing the date of appropriations and the disbursements and balances from my report of December 31st, 1894, as well as for the twelve months ending December 31st, 1895.

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RY OF APPROPRIATIONS UNDER THE INTERIOR DEPARTMENT FOR BIENNIAL FISCAL PERIOD ENDING MARCH 31, 1896.

ATE	ACT	FROM CURRENT		FROM LOAN	
26, 1894	73		365,438 00		.....
16, 1894	84		680,604 96		.....
6, 1894	7		.....		489,359 59
h 15,' 95	21		5,000 00		.....
10, 1895	10		6,000 00		.....
10, 1895	8		.....		8,300 00
20, 1895	21		57,280 28		.....
TOTAL			1,114,323 24		497,659 59
pended to Dec. 1, 1894		353,156 96		73,175 17	
pended from an. 1. 1895, to Dec. 31, 1895.		505,732 01	858,888 97	182,665 73	255,840 90
Balance			255,434 27		241,818 69

ROAD TAX SPECIAL DEPOSIT.

pecial Deposit road tax balance to the credit of the several Road Boards to December 31, 1894....	$ 50,946 78
ıdditional Credits to December 31st, 1895.....	65,075 00
Total	$ 116,021 78
Drawn from January 1st, 1895 to December 31st, 1895	72,625 35
Balance	$ 43,396 43

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The following is a statement of the amounts expended in the several Districts for Road purposes during the year ending December 31st, 1895:

District.	Road Tax Fund.	Roads and Bridges Current.	Roads and Bridges Loan.	Total.
North Hilo	$ 1,509 32	600 73	$ 1,431 10	$ 3,541 15
Hilo	12,780 13	6,202 78	21,061 06	40,043 97
Volcano Road. Puna	1,046 78	3,662 65	8,219 03	12,928 46
Kau	3,154 91	880 10	1,909 46	5,944 47
South Kona	928 40	449 70	5,997 72	7,375 82
North Kona	1,570 21	500 00	4,447 29	6,517 50
South Kohala	148 50	128 00	.....	276 50
North Kohala	3,589 98	44 00	.....	3,633 98
Hamakua	5,611 71	1,250 00	.....	6,861 71
Lahaina	822 47	.....	.....	822 47
Wailuku	6,075 65	.....	.....	6,075 65
Makawao	4,617 53	296 76	.....	4,914 29
Hana	2,051 51	1,800 00	.....	3,851 51
Molokai	689 29	148 52	.....	837 81
Lanai	100 00	.....	.....	100 00
*Honolulu	.....	69,466 96	6,833 07	76,300 03
Ewa and Waianae	4,031 40	.....	.....	4,031 40
Waialua	1,867 00	.....	.....	1,867 00
Koolauloa	1,054 40	.....	.....	1,054 40
Koolaupoko	2,613 97	.....	.....	2,613 97
Lihue	4,649 68	.....	.....	4,649 68
Koloa	1,027 00	.....	.....	1,027 00
Waimea	4,811 89	.....	.....	4,811 89
Hanalei	4,320 10	.....	.....	4,320 10
Kawaihau	3,553 52	.....	.....	3,553 52
Niihau	.....	.....	.....	.....

*The Road Taxes for the District of Honolulu as stated in my report of December 31st, 1894, are paid into the Treasury as a Government Realization and a stated sum covering these receipts is appropriated for the road work of this District under the heading of Roads and Bridges.

DEPARTMENT RECEIPTS.

The receipts of this Department with its several Bureaus for the twelve months to December 31st, 1895, amounted to $267,168.02.

The following is a comparative Detail Statement of these receipts for the year 1895 as compared with the year 1894:

INTERIOR DEPARTMENT RECEIPTS FOR THE YEAR 1895 AS COMPARED WITH THE YEAR 1894.

Receipts at Clerk's Office.	1894.	1895.	Increase.	Decrease.
Licenses :				
Agents				
Alcohol	$ 50 00	$ 250 00	$ 200 00	
Auction and Tax	1,387 04	1,809 94	422 90	
Awa	4,697 00	2,302 00		$2,395 00
Banking	500 00	2,000 00	1,500 00	
Billiard	175 00	475 00	300 00	
Boat	128 00	128 00		
Boatman	36 00	33 00		3 00
Butcher, beef	1,540 00	1,640 00	100 00	
" pork	1,020 00	1,140 00	120 00	
Cake Peddling	850 00	1,000 00	150 00	
Dray	172 50	180 00	7 50	
Driver	330 00	370 00	40 00	
Drug	160 00	160 00		
Firearms	275 00	185 00		90 00
Hack	871 00	1,024 00	153 00	
Live Stock				
Livery Stable	200 00	150 00		50 00
Lodging House	156 00	216 00	60 00	
Merchandise	52,050 00	54,075 00	2,025 00	
Milk	425 00	425 00		
Physician	80 00	90 00	10 00	
Physician, Chinese	10 00	20 00	10 00	
Public Show	1,440 00	2,424 95	984 95	
Salmon	380 00	310 00		70 00
Spirit Wholesale	5,000 00	5,500 00	500 00	
Spirit Dealers	4,000 00	3,500 00		500 00
Spirit Retail	19,000 00	18,000 00		1,000 00

RECEIPTS AT CLERK'S OFFICE.	1894.	1895.	INCREASE.	DECREASE.
Victualing	8,900 00	9,300 00	400 00	.....
Rents	57,501 67	60,173 44	2,671 77	.....
Gov. Realization	6,667 09	6,956 53	289 44	.....
Laws, sales of ..	28 00	86 00	58 00	....
Land office, fees	325 00	335 00	10 00	.....
Land sales.....	14,382 75	17,682 44	3,299 69	.....
" interest	716 10	2,140 89	1,424 79	.....
Homesteads....	6,416 28	8,680 23	2,263 95	.....
" interest	3,545 32	2,575 40	.....	969 92
Commutation ..	.....	.....	.....	.....
Naturalization .	10 00	.....	.....	10 00
	$193,424 75	$205,337 82	$17,000 99	$5,087 92
Receipts of various Bureaus				
Waterworks, Honolulu . . .	39,664 85	43,996 85	4,332 00	.....
Waterw'ks Hilo	1,740 25	2,020 40	280 15	.....
" Koloa	.....	321 25	321 25	.....
Honolulu M'ket	5,823 25	3,893 05	.....	1,930 20
Registry of Conveyances	8,207 75	9,365 50	1,157 75	.....
Electric Light .	4,866 35	2,233 15	.....	2,633 20
	$253,727 20	$267,168 02	$23,092 14	$9,651 32

The above shows an increase of receipts for the year of $13,440.82.

TABLE SHOWING NATIONALITY OF LICENSE HOLDERS

Comparative Statement for Two Years.

CLASS	NATIONALITY							
	CHINESE		JAPANESE		PORTUG'E		ALL OTH'R	
	1894	1895	1894	1895	1894	1895	1894	1895
Alcohol	....	....	....	....	....	....	1	3
Auction	....	....	....	....	2		16	16
Awa	13	8	....	....	....	....	11	4
Banking	....	....	....	1	....	....	1	3
Billiard	1	2	....	1	1	1	5	8
Boat	....	1	3	1	....	....	24	26
Boatman	....	....	3	1	....	....	33	32
Butcher—Beef	14	12	2	....	7	15	54	55
Butcher—Pork	46	51	....	....	1	1	4	5
Cake Peddling	25	30	9	10	....	....	....	....
Dray	13	16	3	2	3	5	50	49
Driver	76	71	3	5	32	38	219	256
Drug	....	....	....	....	....	....	4	4
Firearms	....	....	....	....	1	....	54	37
Hack	58	57	....	1	7	19	89	110
Livery Stable	....	....	....	....	....	....	4	3
Lodging House	36	65	3	3	1	1	39	39
Merchandise	442	441	105	116	30	43	189	201
Milk	1	1	....	1	9	8	5	7
Physician	....	....	1	2	....	....	6	7
Physician, Chinese	1	2	....	....	....	....	....	....
Public Show	40	101	16	17	....	....	80	44
Salmon	5	7	....	....	3	1	30	23
Spirit—Wholesale	3	4	1	2	....	1	5	4
Spirit Dealers	....	....	..	1	1	1	7	5
Spirit—Retail	1	2	....	....	2	1	16	15
Victualing	133	145	31	26	4	1	10	14
Totals	867	913	163	171	104	136	870	919

In the above totals, Physician and Public Show licenses are not included. The license to a Physician to practice, is not limited and the license for Public Show is issued (with certain exceptions) for each exhibition. The totals give the actual number of individual, annual license holders.

DETAILED STATEMENT OF GOVERNMENT REALIZATIONS, RECEIPTS, INTERIOR DEPARTMENT, FOR YEAR ENDING DECEMBER 31ST, 1895.

Fees—		
Brands, Registry of		$ 20 00
Building Permits		615 00
Candidates—		
For Senators	$50 00	
For Representatives	25 00	75 00
Certificates, verifying documents		19 00
Certificates, in re publishing newspapers		12 00
Charters, recording and amending of		188 00
Dis-incorporation		5 00
Patents of Invention, Caveats, Copyrights, Label and Trade Marks		105 00
Permission to Assign, Transfer and Mortgage Government Lease		10 00
Registry of Copartnerships		70 00
Registry of Women trading in their own name		4 00
Return of Duplicate payments, etc		214 85
Sales—		
Animals, Government, condemned		98 60
Buildings, Lumber and Fire Wood, old		560 90
Manure, soil, sand coral, etc		880 15
Old Copper		893 50
State Carriages		357 25
Sundry old material, etc		340 65
Sundry—		
Government Survey, sale of Maps, etc		5 25
Gunpowder storage		126 45
Pound Balances not called for		72 64

Quarry Stone	58 28
Royalty on Guano taken from Pacific Islands	1,849 42
Ferry, Government, (receipts from)	413 24
Use of New Market Building	20 00
Lahaina Market, (rent of Stalls)	14 00
Steam Roller, carts, prison labor, etc	14 35
	$7,042 53

GOVERNMENT LANDS.

Under Act 26 of the Special Session of the Legislature, approved the 14th day of August, 1895, a Board of three persons to be designated the Commissioners of "Public Lands" was created and to their control and management was transferred all Government Lands, other than town Lots and certain Government property specified in said Act, which have been continued under the superintendence of the Interior Department.

The transfer of said lands from this Department was consumated during October, 1895, when said Commission was duly organized.

I beg to submit the following report on Government Land transactions from January 1st, 1895 to October 31st, 1895., viz:—

LAND SALES.—PURCHASE ON TIME PAYMENT.

In my report to December 31st, 1894, I stated that there had been disposed by the Government under this system, 19 Lots in Kaumana, Hilo, and 1 Lot in Puualaea, N. Hilo, Hawaii. Since then the Government has disposed the following Lots in the Districts of Hilo and Puna, Hawaii.

February 13, 1895.—4 Lots at Kaumana, Hilo.
3 " " Kahoahuna, "
2 " " Paana, "
7 " " Laupahoehoe, Hilo.

July 25, 1895.—12 Lots at Keekee, Kehena, Kupahua and Kamaili, Puna.
8 " " Papaaloa, Kihalani, Kapehu, Weloka, Kaiwilahilahi and Moanalua, North Hilo.

Making a total of 56 Lots disposed under this system during 1894 and up to October 31, 1895.

The purchasers under this system have made considerable progress in improving their lots, such as enclosing them with suitable fences, building houses, putting a portion of the land under cultivation with coffee, cane and vegetables, and clearing more land for planting purposes.

These purchasers deserve great credit for the progress they have made, as they have not only been in possession of their lots for a short time but the difficulty of access to their holdings should be taken into consideration, they have only trails to pack their building materials, provisions, etc. from the landings, and that partly over boggy lands and partly over lava and pahoehoe.

Good trails or cart roads of these lots as well as to adjoining Government lands are badly needed and something should be done in this matter to encourage industrious settlers.

The increase in taxation on the value of property along the line of these roads will more than pay for constructing the same.

In conclusion I beg to say that this system of land sales has met with general favor, and the manner in which the settlers are pushing ahead with the cultivation and improvement of their holdings, proves conclusively that this system of disposing of Government lands to small farmers is a success.

HOMESTEADS.

The Homestead lots that were unoccupied at the date of transfer were principally those upon which the purchase price had been over valued, and the lots inaccessable on account of bad roads, and in some cases of no roads at all.

The Homestead roads in general are not of the best, they are principally trails over very boggy lands and over pahoehoe and lava beds. In view of the energy and industry shown by a large majority of these settlers and an evident desire to live up to the letter of their contracts, they should be encouraged by having passable cart roads built to enable them to cart their produce to market, which is at present in many instances almost an impossibility.

The following table will show the number of tracts of land plotted out into Homestead lots, total number of lots and the disposition of the same from the inauguration of this system September 17th, 1887 to October 31st, 1895 :

Island.	District.	Tract.	No. of Lots Laid Out	No. of Lots Homesteaded	No. of Lots Patented	No. of Lots Paid Up and not Patented	No. of Lots Untaken
Oahu ..	Nuuanu ..	Nuuanu	11	11	11	....	----
Maui ...	Kula	Waiakoa	52	50	....	29	2
" ...	"	Pulehuiki and Kamehameiki	44	41	....	26	3
Hawaii .	Hamakua	Ahualoa	86	85	20	7	1
" ..	"	Kaapahu	40	37	....	3	3
" ..	"	Kaunamano	18	18	3	8	....
" ..	"	Paauilo	30	29	.	19	1
" ..	"	Kaauhuhu	13	13	3	1	....
" ..	"	Kainehe	14	14	....	4	----
" ..	N. Kona ..	Kohanaiki	59	57	23	10	2
" ..	" ..	Kealakehe	21	21	8	2	....
" ..	" ..	Kaulana	27	27	4	3	....
" ..	" ..	Puaa	4	4	....	3	....
" ..	Hilo	Kaiwiki	38	38	....	16	....
" ..	"	Kahuku	16	14	....	....	2
" ..	"	Kuaia and Paana.	39	29	....	3	10
" ..	"	Kaieie	10	10	....	9	....
" ..	S. Kona...	Kalamakowali ..	7	6	....	1	1
" ..	" ...	Olelomoana and Opihale	12	....	....	....	12
" ..	" ...	Kukuiopae	7	4	....	....	3
" ..	Kau	Ninole and Wailau	55	40	....	3	15
" ..	N. Kohala.	Hualua	20	3	2	....	17
" ..	Puna	Kaohe	16	11	----	....	5
" ..	"	Nanawale	20	18	...	..	2
Molokai	.....	Hoolehua	10	10		.....	....
"	.....	Kamililoa.....	9	1	....		9
			678	591	74	147	88

GOVERNMENT LANDS UNDER DEPARTMENT OF THE INTERIOR.

Section 2 of the Land Act of 1895 reserves under the control and management of the Minister of the Interior the following Government property :—

"Town lots, sites of public buildings, lands used for public purposes, roads, streets, landings, nurseries, tracts reserved for forest growth and conservation of water supply, parks and all lands which may hereafter be used for public purposes."

On October 11th, 1895, the following schedule defining lands and boundaries of lands to remain under the management and control of the Minister of the Interior separate and apart from those in charge of the Commissioners of Public Lands, was filed at this office with the understanding that the same should be amended and added to from time to time as circumstances should require.

COPY.

"For the purpose of clearly defining what lands in certain localities are to remain under the management and control of the Minister of the Interior in compliance with Sec. 2 of Land Act of 1895, it is hereby specified and understood that all Government lands named in the schedule below shall remain under the control and management of the Minister of the Interior, separate and apart from those in charge of the Commissioners of Public Lands, but not meaning hereby to affect any other lots of land in other localities which are clearly intended by law to remain under control of the Minister of the Interior."

SCHEDULE.

In vicinity of Honolulu :

1st. All Government lots and lands within the tract which is bounded on the east by West ridge of Manoa

Valley from the Koolau range to "Ualakaa" or "Round Top" then by straight line to S. W. angle of Punahou pasture, then by Punahou St. Waikiki road, road passing "Moehonua" premises and beach road to sea.

"On the west bounded by the top of the west slope of Nuuanu Valley from the Koolau ridge to foot of Nuuanu ridge below Judd St. thence around the foot of ridges to Kalihi boundary to the sea, but reserving however to the Commissioners of Public Lands the land of Kapaloa in Pauoa, and Kamookahi and Kuwiliwili in Kapalama, all of which are agricultural lands under leases from the former Commissioners of Crown Lands.

2nd. All that portion of the land of Kaneloa now under lease to the Kapiolani Park Association.

In the vicinity of Hilo, Hawaii.

1st. All Government lands within the tract lying between the Wailuku river and the west boundary of Ahupuaa of Waiakea, and extending from the sea to the lower boundary of Piihonua, lease to J. Baker, and a line S. 45 E. true from said lower boundary of Piihonua to Waiakea Ah'p West boundary.

2nd. The four acres reserved from Waiakea lease for Government purposes and also the land of Makaoku which includes Cocoanut Island.

In Lahaina Maui.

All lots used for any Public purposes, and below the main Street (makai) in vicinity of the Market, Landings &c.

Sgd. J. F. BROWN,
Agent of Public Lands.

" J. A KING,
Minister of the Interior.

LAND SALES.—CASH PURCHASE.

TEN TRACTS OF LAND HAVE BEEN SOLD AT PUBLIC AUCTION FOR THE YEAR TO DECEMBER 31ST, 1895, UPON WHICH FEE SIMPLE TITLES WERE ISSUED AS FOLLOWS:

DATE OF SALE.	PURCHASER.	LOCATION.	AREA.	ISLAND.	PURCHASE PRICE.
Jan. 17, 1895	Paauhau Plantation Co.	Kaunamano, Hamakua	59 acres	Hawaii	$ 800 00
May 7, 1895	Kohala Sugar Co	Old Govt. Road, Kohala.	2½ acres	"	100 00
May 30, 1895	H. Congdon	Lot Punchbowl, Honolulu	12,150 sq feet	Oahu	150 00
May 30, 1895	E. and Frank Halstead	Kamananui, Waialua	12.30 acres	"	61 50
June 4, 1895	Gasper Sylva	Mokuleia, Waialua	220 acres	"	451 00
Dec. 3, 1895	Manuel A. Goes and M. Caldeiro	Pauoa, Honolulu	6-10 acres	"	1,060 00
Dec. 18, 1895	Mrs. T. E. Krouse	Lot 600, Punchbowl, Honolulu	35,024 sq feet	"	710 00
Dec. 18, 1895	Dr. C. B. Wood	Lot 601, Punchbowl, Honolulu	33,297 sq feet	"	560 00
Dec. 18, 1895	Dr. C. B. Wood	Lot 602, Punchbowl, Honolulu	31,235 sq feet	"	530 00
Dec. 18, 1895	H. M. Dow	Lot 603, Punchbowl, Honolulu	29,900 sq feet	"	430 00
					$4,852 50

TOWN LOTS, HILO, HAWAII.

Two blocks, of 18 lots in one and 10 lots in the other have been laid out between Waianuenue street and Wailuku stream, and between Bridge street and the continuation of Front street—in order that the Government may be able to meet the increased demand for business sites in that town.

Six of these lots facing Waianuenue street are at present under lease and six more are now held by tenants at will.

INTERIOR DEPARTMENT—LAND OFFICE.

Although considerable of the land work in this office has been transferred to the "Public Land Office," there still remains under the control of the Minister of the Interior, the care and custody of the original documents and records upon which land owners hold their property in fee, also the issuing of all patents upon the confirmation of award by the Land Commission granting absolute fee simple title. and all patents upon the confirmation of the Land Commission granting an Estate of Freehold less than Allodial—and also patents upon sale of Government lands under the control of this Department.

In connection with the original records above mentioned, I beg to call your attention to the recommendation made in my report of December 31st, 1894, that an appropriation be made for the purpose of making copies of the same for constant use, in order that the originals can be saved from the wear and tear caused by the con-

tinued handling they receive from parties searching titles.

If this provision is not made a number of these records will require mending and rebinding at an early date.

The clerical work connected with the copying of these records can be made as a part of the duties of the clerk in charge of the Interior Department Land Office.

THE FOLLOWING IS A STATEMENT OF CORPORATIONS FOR MERCANTILE, AGRICULTURAL AND MANUFACTURING PURPOSES WHO HAVE AMENDED THEIR CHARTERS DURING THE YEAR ENDING DECEMBER 31ST. 1895:

Title of Corporation.	Date of Charter.	Term.	Original Capital.	No. of Shares	Par Value.	Amendments.			No. of Years.
						Present Capital	Pr's'nt Shares	Par Value.	
Hawaiian Electric Co., Ltd.	1891, Oct. 13	50	$ 20,000 00	200	$ 100 00	$ 250,000 00	2,500	$ 100 00	.....
Laupahoehoe Sugar Co	1883, June 19	50	600,000 00	6,000	100 00	300,000 00	3,000	100 00	.....
Princeville Plantation Co	1875, Sept. 15	20	120,000 00	120	1,000 00	120,000 00	120	1,000 00	50

LIST OF CORPORATIONS FOR MERCANTILE, AGRICULTURAL AND MANUFACTURING PURPOSES, CHARTERED FROM JANUARY 5TH TO DECEMBER 31ST,

1895.

Title of Corporation	Date of Charter	Term of Years	Capital Stock	No. of Shares	Par Value
Hilo Portuguese Sugar Mill Co.	1895, Nov. 3	50	$ 30,000 00	60	$500 00
California Stock and Dairy Co..	1895, Mch. 27	..	2,000 00	20	100 00
Hawaiian Ostrich Farm Co.....	1895, Mch. 23	50	15,000 00	150	100 00
The Kanekoa Coffee Co.....	1895, Mch. 20	30	20,000 00	200	100 00
Pacific Fruit Co.	1895, Apr. 29	50	10,000 00	100	100 00
Kona, Kau Tel. and Tel. Co....	1895, June 3	50	12,000 00	480	25 00
Pioneer Mill Co..	1895, June 29	50	600,000 00	6,000	100 00
Olaa Coffee Co...	1895, July 3	50	30,000 00	300	100 00
Hilo Tribune Publishing Co....	1895, Nov. 13	..	1,500 00	30	50 00
California Feed Co	1895, Dec. 13	50	50,000 00	500	100 00

IMPORTATION AND INSPECTION OF LIVE STOCK FOR THE YEAR ENDING DECEMBER 31ST, 1895.

PORT OF ARRIVAL.	FROM.	STALLIONS.	MARES.	GELDINGS.	MULES.	BULLS.	COWS.	SWINE.	SHEEP.	DOGS.
Honolulu.....	San Francisco.....		51	35	124	9	8	1968	39	2
	British Columbia....			1						
	Great Britain.....							2		
	Australia.....		2	6					41	
			53	42	124	9	8	1970	80	2
Mahukona.....	San Francisco.....				18					
Kahului.....	San Francisco.....				2		2		51	
Hilo.....	San Francisco.....	1	18	38	87	21	20			2
	Totals.....	1	71	80	231	30	30	1970	131	4

I would respectfully submit herewith the Annual Reports of the various Bureaus of this Department as follows:

Bureau of Government Survey.
Bureau of Public Works.
Bureau of Water Works.
Clerk of the Market.
Board of Fire Commissioners.
Honolulu Roads.
Bureau of Conveyances.
Bureau of Immigration.
Bureau of Agriculture and Forestry.

These reports present a full history of the workings of the various branches under this department during the past year and will be found well worthy of perusal.

The Chief of each Bureau has made a careful study of the estimates of his requirements for the coming two years, and I trust that both the result of their labors and their estimates of requirements may receive the consideration of the coming Legislature.

I have the honor to be, Sir,

Your Obedient Servant,

J. A. KING,
Minister of the Interior.

To

SANFORD B. DOLE,
President of the Republic of Hawaii.

REPORT

OF THE

BUREAU OF GOVERNMENT SURVEYING

FOR THE

YEAR ENDING DECEMBER 31ST. 1895.

To J. A. KING, MINISTER OF THE INTERIOR—

SIR:—I have the honor to submit to you the following report of the Bureau of Government Surveying for the year ending December 31st, 1895.

Two events during the year 1895 interrupted the regular work of this Bureau, viz: the insurrection in January, and the cholera epidemic of September and October.

FIELD WORK.

In the Island of Hawaii Mr. Kanakanui was employed during the latter part of April and the first part of May in surveying Homestead lots in Paauilo, Hamakua.

Mr. A. B. Lobenstein, after resurveying and marking the Homestead lots in Kahuku, Hilo, executed two section maps of part of Puna for this Bureau on a scale of 500 feet to the inch, viz: one extending from Nanawale to Pohoiki and another from Pohoiki to Kehena, besides

a survey of upper Keahialaka, Kaliu, and Kauelean in southern Puna.

Mr. W. A. Wall was employed in September in making a map of the Kalopa and Paauhau section of Hamakua, Hawaii, on a scale of 500 feet to the inch.

In July Mr. J. S. Emerson furnished the Bureau with a map of the Pahala region in Kau, on the above scale, besides a sketch map of the triangulation and calculations of heights. the work being based on a trigonometrical survey. It is to be hoped that the gap remaining between this survey and that of Puna may soon be filled in.

In South Kona Mr. W. A. Wall made a survey and map of the Hookena section from Kiilea to Kalahiki, inclusive, on a scale of 500 feet to the inch. Mr. W. Bruner's salary was paid by this Bureau, while he was engaged in surveying roads, chiefly in the districts of Kona and Hilo, Hawaii. He also furnished this office with a map of the new Kohala road.

Mr. E. D. Baldwin besides surveying Homestead lots in Southern Puna, has surveyed and furnished plans and profiles of Rainbow Street, and certain other streets in Hilo.

Mr. M. D. Monsarrat also furnished a map and notes of survey of Okoe, South Kona, in December last.

In the Island of Maui, Mr. S. M. Kanakanui was employed from the middle of June till August 21, surveying Homestead lots in Kaupo, also in laying out roads for Homesteads in Kula. He was employed again in December in surveying Wailua, Koolau, Maui, locating all the Kuleanas in the same. Mr. M. D. Monsarrat also furnished surveys of three small Ahupuaas in

Lahaina. He has furnished a map of the northern side of the Island of Molokai, including the Leper Settlement, which he surveyed in 1894. He has also delivered maps of the section from Wailua to Moakea, inclusive, and of the section extending from Moakea to Halawa, on a scale of 500 feet to the inch.

As regards Honolulu and its vicinity, more than the average amount of field work has been done, but it seems hardly necessary to give the details of the numerous surveys of street lines and grades, of Government lots, of proposed improvements, etc.

The Cholera epidemic, which existed during September and October, drew public attention to the unsanitary condition of the Nuuanu stream, and led to thorough surveys and examinations of the land titles of the whole neighborhood, as well as of the proposed new channel for the stream, which were executed by Mr. W. E. Wall. The absence of the City Surveyor, Mr. F. S. Dodge, for four months on important Government service was severely felt, but the more pressing duties of his department were ably discharged in the interim by Mr. W. E. Wall.

By direction of the Minister of the Interior, Mr. Dodge, assisted by R. W. Atkinson, made a careful survey of Necker Island in July.

OFFICE WORK.

It seems unnecessary to repeat former explanations in regard to the nature of the office work, which continually tends to increase on our hands.

STATISTICS OF OFFICE WORK.

There have been registered and placed on file in this office 50 new maps, and 30 miscellaneous documents prepared for the use of this Bureau. There have been furnished 35 new surveys, besides over 100 copies of Homestead Surveys already on file. There have been 35 reports made on applications for lease or sale of Government lands. About 100 tracings have been made, about equally divided between the following objects, viz.: auction sales, grants, road purposes, surveyors in the field, and various parties. Tracings for filing in the office are not included in the above.

OTHER OFFICE MATTERS.

A safe is much needed in the office for the security of the most important maps and documents. New maps should be published of the whole group as well as of the Island of Oahu, and a set of section maps of Hawaii, and it may be thought worth while to have a map of Molokai lithographed. It is also intended to construct a Relief Map of Hawaii, similar to those of Maui and Hawaii.

METEOROLOGY.

In regard to meteorology, the regular series of observations have been kept up, and monthly reports published for the benefit of the public. Exchanges are kept up with a large number of Foreign Weather Bureaus. Tidal observations have also been continued with our self-registering tide-gauge. A study of our tidal observations has shown that a small periodical change of the

average level of the sea takes place here, which corresponds with the lately discovered "wobbling" of the earth's axis, and has the same period, viz.: 428 days. This conclusion has since been confirmed by the result of the study of tidal records at San Francisco, at Portland, Maine, and at the mouth of the Helder in Holland.

The time will no doubt come when the weather service in this country will be set apart as a distinct bureau, which will enable the assistant in charge of this office to devote his whole time to matters more closely connected with surveying. It seems desirable that a regularly employed and equipped observer should be stationed at the Volcano of Kilauea to observe and record both the meteorological and volcanic phenomena of that place. With the beginning of the year 1896, the time of the meridian 10h. 30m. west of Greenwich has been adopted as the Standard time for the Hawaiian Islands.

FUTURE FIELD OPERATIONS.

By the provisions of the new Land Law the surveying of Homestead lots as well as that of a certain class of Government grants and leases, is placed under the control of the Land Commission. The composition of that Commission gives assurance that such surveys will be carried on in accordance with the methods of the Government Survey, and carefully connected with its previous work, and it has been decided that the resulting maps will be deposited in this office.

The general survey of the country, the settlement of boundaries, and in particular, the surveying of all town lots and of all lands, of whatever description, reserved for

public purposes, will remain under charge of this Bureau.

The work which seems most urgently called for is the completion of the survey of the districts of Puna and Kau, and the detailed surveys of land titles in the District of Kona, Hawaii.

In view of the proposed new map of the group, it seems desirable to complete the triangulation connecting Hawaii with Maui and Kahoolawe, and to make a rapid survey of the latter island.

As has been already stated, the line of work to be undertaken will depend upon the future policy of the Government, and the action to be taken by the next Legislature.

January 21, 1896.

I beg leave to submit the following estimates of the Bureau of Surveying for the biennial period ending March 31st, 1898, viz.:

Salary of Surveyor General	$ 6,000
" Assistant in charge of office	4,800
" " on city and general work	4,800
" " " " " "	3,600
" Sub-Assistant in general work	1,800
" " " city and general work	1,200
" of Messenger	960
	$23,160

Expenses of field parties	$ 9,000
Office expenses, instruments, map, etc	1,500
Meteorology and tide gauge	800
Total expenses	$11,300

I remain very respectfully,

Your obedient servant,

(Signed) W. D. ALEXANDER,
Surveyor-General.

REPORT

OF

Superintendent of Public Works.

JAS. A. KING, ESQ., MINISTER OF THE INTERIOR:

SIR:—The amounts expended under the Bureau of Public Works during the year 1895 from current account, which does not include any of the items which may be classed as New Improvements, are as follows:

DREDGING HONOLULU HARBOR....$13,730.01.

The slips between Brewer's and Nuuanu St. wharves, between Nuuanu and Sorenson's, and on Ewa side of Sorenson's, have been dredged from depths varying from 21 to 4 feet; to a uniform depth of 24 feet. A considerable area in front of these wharves and extending to nearly opposite the O. R. & L. wharf has also been dredged to the same depth. An area 200 feet wide by 1000 long near the west side of the harbor has also been dredged to a depth of 30 feet. This was done in order that there might be no difficulty in accommodating the larger class of naval ships.

LANDINGS AND BUOYS.

Honolulu	$13,495 54
Hawaii	1,262 73
Maui	696 87
Kauai	160 73
	$15,615 87

An addition has been made to the Pacific Mail Wharf shed by roofing in the space between the old shed and the stone warehouse. This addition has been fitted up to be used as a fumigating warehouse.

Brewer's wharf shed has also been extended, removing an old section which was too low. The appearance of the shed is much improved thereby.

An experiment has been made on the Nuuanu St. wharf with asphaltum. A portion of the planking has been covered with a mixture of asphaltum and sand about half an inch thick. This gives an excellent footing for the teams and it promises to prevent to a large degree the wear of the plank surface, which is the great expense in keeping up the most of our wharves.

An addition has been made to the Likelike wharf to accommodate the after gangway of steamers like the Claudine and Kinau.

The work on Honolulu wharves has been distributed as follows:

	Landings and Buoys Honolulu.	*Landings and Buoys General.*	*Total.*
Pacific Mail Wharf	$ 891 06	$ 675 60	$ 1,566 66
" " " shed addition	465 17	.....	465 17
Likelike "	687 25	265 30	952 55
Kinau "	379 13	505 00	884 13

	Landings and Buoys Honolulu.	*Landings and Buoys General.*	*Total.*
Kekuanaoa "	351 76	179 90	531 66
I. I. S. N. Co.'s "	361 15	292 29	653 44
O. S. S. Co.'s "	2,390 70	877 23	3,267 93
Allen Street "	446 40	332 80	779 20
Boat Landing	24 50	.....	24 50
Brewer's Wharf.....	188 77	104 64	293 41
" " shed extension..	400 90	421 57	822 47
Nuuanu St. Wharf.....	277 46	243 25	520 71
Sorenson's "	.....	4 50	4 50
" " shed.....	157 15	.....	157 15
Old Fish Market "	30 50	.....	30 50
Cattle "	92 32	13 00	105 32
Quarantine "	77 52	.....	77 52
Immigration "	4 04	1 70	5 74
Anchors and Buoys.....	371 85	455 05	826 90
Sweeping Wharves.....	493 65	291 25	784 90
Pile Driver.....	36 22	24 75	60 97
Tools and Equipment	223 44	119 99	343 43
Miscellaneous	251 38	85 40	336 78
Total	$8,602 32	$4,893 22	$13,495 54

ROADS AND BRIDGES.

Hawaii—		
North Hilo	$ 600 73	
Volcano Road.....	3,689 52	
Kau.....	880 10	
North Kohala.....	44 00	
		$ 5,214 35

Maui—	
Hana	1,800 00
Molokai	148 52
Oahu—	
Honolulu	865 00
	$ 8,027 87

The work in N. Hilo was a change of grade in Umauma gulch. Extensive repairs were needed on the Volcano road and it was deemed advisable to use the prison gang on that work, and it will be necessary to continue this work till about April 1st.

The amount spent in Kau was on repairs to the Peter Lee road from Pahala to the volcano, which were completed early in March.

The work in N. Kohala was a survey of a section of the road to Waimea going through certain cane fields, which was not staked out with the balance of the line on account of standing cane.

At Hana a new bridge has been built near Hamoa across Waiahonu stream where a former bridge had been carried away. The old bridge was a single span of 62 feet; the new one is two spans of 60 and 38 feet providing a considerable increase in the water way.

The amount charged to Molokai consists of items belonging to the bridge at Wailua which was really completed in 1894. The item for Honolulu was the purchase of a portable rock crusher, which will greatly facilitate the repairing of streets where it is not convenient to haul crushed rock from Moiliili.

REPAIRS FURNITURE AND ADDITIONS TO GOVERNMENT BUILDINGS.—DEPARTMENT BUILDINGS, HONOLULU.

Executive building	$5,956 79	
Judiciary "	1,274 37	
Kapuaiwa "	229 06	
Custom House	4,205 26	
Post Office	370 46	
Police Station	230 02	
Oahu Prison	2,342 42	
Engine House No. 1	139 07	
" " No. 2	101 21	
" " No. 3	860 50	
Government Storehouse	7 05	
		$15,716 21

MILITARY.

Drill Shed	$ 125 37	
Barracks Kitchen	108 02	
" Cess Pool, etc	399 45	
Bungalow	182 08	
Powder Magazine	2 75	
		$ 817 67

RENTED BUILDINGS.—(YIELDING AN INCOME FROM RENTAL OR STORAGE.)

Kerosene Storehouse	$ 581 10	
Old Fish Market	71 40	
Powder Magazine	24 40	
Old Custom House	504 77	
Brewer's Building	78 62	
Honolulu Hale	62 75	
Lahaina Market	39 89	
		$ 1,362 93

COURT HOUSES AND JAILS OUTSIDE HONOLULU.

Hawaii.

Kohala Court House Fence	$ 385 00	
Kohala Jail	5 20	
Hilo Court House	312 86	
Kailua Court House and Jail	105 00	
		$ 808 06

Maui.

Wailuku Court House and Jail	$ 169 75	
Lahaina Court House	100 46	
Makawao Jail	103 85	
Kahului "	9 80	
Paia "	2 75	
		$ 386 61

Oahu.

Waianae Court House	3 00

Kauai.

Lihue Court House	50 75

MISCELLANEOUS.

Electric Light Station	$ 79 00
Government Nursery	114 12
Lahaina Light House	3 00
Hilo Tax Office	236 05
Signal Station Diamond Head	57 15
Insane Asylum	17 83
Government Dispensary	7 15
Pilot Office	8 25

Forester's House	6 25	
Removing Palace Stable	66 99	
Kamehameha Statue	160 00	
		$ 755 79

FENCES, ETC.

Gate Executive Building	$ 24 50	
Fence Miller Street Lots	218 36	
Fence Pumping Station	129 16	
Fence Immigration Depot	4 50	
Drain Government Store House	22 75	
		$ 399 27
		$20,300 29

CURBING AND PAVING GOVERNMENT SIDEWALKS.

A granite curb and native stone paving has been laid on Fort St. from Hopper's building to the esplanade on the west side and from Halekauila to Allen Sts. on the east side; the same also on Allen St. from Fort to the entrance to the Oceanic wharf shed; 73 ft. of native stone have been laid along the lot owned by the Government on makai side of Queen St. A section has also been laid along the Honolulu Hale lot. A wooden curb has been placed along the outer side of the Queen St. extension from Kekaulike to King Sts. The items are as follows:

Fort and Allen Sts	$2,969 50	
Queen St	150 00	
Queen St. extension	88 20	
Honolulu Hale	100 00	
Gateways Judiciary Building	12 00	
		$3,319 70

ELECTRIC LIGHT.

The amount expended during the year besides the regular pay roll of $550 a month is $4,830.75 or an average of $402.56 per month.

The number of arc lights in operation at present is 112.

The number of incandescent lights furnished free by the Government is as follows:

Executive Building	94	
Bungalow	53	
Drill Shed	75	
Judiciary Building	62	
Station House	24	
Oahu Prison	48	
Insane Asylum	26	
Post Office	32	
Custom House	8	
No. 1 Engine House	15	
No. 2 " "	14	
No. 3 " "	15	
Oceanic Wharf	33	
Pacific Mail Wharf	27	
Electric Light Station	18	
Water Works Office	2	
Land Office	2	
Honolulu Library	22	
Fort Street School	42	
Hotel Band Stand	125	
American League	14	
Enterprise Dairy	6	
Streets	10	
		767

The Queen's Hospital and Kaumakapili Church are furnished at reduced rates...	144
Full paying rates.....	169
Total	1,080

Following is the

COLLECTOR'S REPORT.

W. E. ROWELL, ESQ.,
Supt. of Public Works,

SIR:—I have the honor to submit herewith my report as collector of rates for Government Electric Lights, for the year ending December 31st, 1895 :

The amount collected during the year, from rates, was.....	$ 2,233 15
The amount outstanding, December 31st, 1895, was.....	60 00

There are, at the present time, seven paying rates, using 313 lights, the receipts being $129.85 per month.

The estimated receipts for the coming year, at the present rate, are $1,558.20.

Respectfully submitted,

(Signed) ANDREW BROWN,
Collector of Rates, Government Electric Lights.

I must repeat what I said in my last report. There is urgent need for more arc lights on the streets; 70 more lights should be put in, but all the available power at the Electric Light Station is required for the present lights. There are two solutions to the problem; either the power must be increased or the Government must abandon the incandescent light system. The Hawaiian

Electric Co. sometime since made a proposition to take over the Government Electric Light Works, paying therefore a monthly rental of $200, and to furnish all incandescent and arc lights required, at fixed rates. This proposition seems to be reasonable and I should advise its acceptance, provided, they are still willing to carry it out, and provided also that the Legislature pass the necessary act to permit the lease to be made.

It is important to note here that there is and has been for some months an abundance of water so that the dynamos are working to their full capacity. It will be an exceptional season if the water supply does not fall off very much during the summer. and in that case the number of lights which it is possible to carry will be proportionately diminished from the figures given above; so that some provision must be made to make it possible even to continue the lights we are furnishing now.

INCREASE OF POWER.

If no arrangement is made to discontinue the incandescent system, the alternative of increasing the power must be adopted. This can be done by putting in auxilliary steam power, or by building the storage reservoir above Luakaha and connecting the same with the Electric Light Station. The water head would be more than doubled by this plan so that more than double the power can be developed from the same amount of water, and with the water at its lowest stage there would be abundant power to run all the lights while with full streams there would be an excess of power available which could profitably be rented to the Hawaiian Electric Co. or any one else requiring power.

The estimated cost of this plan is as follows:

Storage Reservoir	$ 45,000 00
22in. Pipe to Electric Light Works	80,000 00
	$ 125,000 00

For fuller details in regard to increase of power and cost of system I will refer you to the report of G. F. Allardt contained in the report of the Minister of the Interior to the Legislature of 1890, p. 168.

If either plan for increasing the number of arc lights is adopted there must be an appropriation to cover the cost of lamps, poles and wire. For this $125 per light will be required. Seventy lights will require an appropriation of $8,750.

STEAM TUG.

The expense of the steam tug for the year not including the regular pay roll of $525.00 per month is detailed as follows:

Coal	$1,593 75	
Extra Labor	274 75	
Repairs	1,527 28	
Tools and Equipment	79 60	
Oil, Waste, &c	630 65	
		$ 4,106 03

WATER WORKS.

Outside of Honolulu the amounts expended for repairs and expense have been:

Hilo Water Works	$ 141 88
Laupahoehoe Water Works	74 73
Koloa Water Works	17 46

The improvements recommended in my last report for Laupahoehoe have been begun but not completed; the new pipe for Koloa has also been ordered, and I would ask that the appropriations made for these items be continued.

INCIDENTALS AND TRAVELING EXPENSES.

Are itemized as follows:

Stationery	$ 84 68	
Books and Periodicals	85 23	
Office Implements, &c	69 34	
Postage Stamps	17 50	
Telephone	60 00	
Assistants	861 75	
Traveling Expenses	39 50	
		$ 1,218 00

BOARD OF HEALTH.

The following amounts were expended for the Board of Health under this Bureau:

Sewage, Wharf	$ 224 06	
Sewage, Scows (3)	930 96	
Insane Asylum, Female Ward	7,412 25	
Insane Asylum Tank	115 93	
House to Mitigate	220 85	
Fumigating Plant	3,570 64	
Disinfecting Plant	3,893 00	
Odorless Excavator	9 25	
Old Fish Market	150 55	
Cholera Hospital	548 40	
Cholera Expense Whitewashing	71 75	
Repairs to Dispensary	157 75	
Quarantine Wharf	10 80	
		$17,316 19

The Fumigating Plant includes the apparatus, furnished under contract by the Honolulu Iron Works, the erection and the housing of the same, and the preparation and connection of a warehouse in which goods can be fumigated. The apparatus consists of a sulphur furnace with a fan blower to take the fumes and force them into the warehouse, and an engine and boiler to operate the same.

The Disinfectant Plant was furnished under contract by C. R. McVeigh, and will be erected on Quarantine Island. It consists of a jacketed steam chamber 16 feet long with two cars, each having six removable trays upon which clothing or goods to be disinfected can be arranged. A car with its load can be run into the chamber and replaced by the other car as soon as sufficient time has passed to complete the disinfection, thus keeping the chamber in almost continuous operation.

NEW IMPROVEMENTS.

A number of the improvements for which appropriations were made have been pushed forward during the year.

NEW ROADS.

Special appropriations were made for a number of new roads on Hawaii, the amounts expended from which have been as follows:

New Road	North Kona	$4,447 29
"	South Kona	5,997 72
"	Kau	1,909 46
"	Puna	8,219 03

Reconstruction Roads Hilo and North Hilo	2,438 17	
Road to Kaiwiki Homesteads	3,500 00	
Road through Maulua Gulch	575 00	
		$27,086 67

The work in North Kona was on a continuation of the road from Kailua North towards Kohanaiki which was begun in 1891. During the first four months of the year 2,900 feet of road were graded at a cost of $1,902.55. This brought the road to a point where good material could be obtained for top dressing, and the labor of the next four months was spent in top dressing the lower portion of the road which had been graded in a former period. No work has been done on this road since early in September.

In South Kona a new road was laid out by Mr. Bruner to connect with the upper road. Work began in April and on December 31st, there are completed 11,960 feet of road 16 feet wide, at an average cost of a little more than 50 cents per foot. The work was begun at the junction with the upper road, and by March 31st will probably be completed to Napoopoo. This road will make it possable for the inhabitants of the oldest improved section on the upper road in Kona to haul goods from the landing on a grade not exceeding 6 per cent.

This will make the fourth road constructed on a reasonable grade in Kona from the coast to the upper road along which the productive lands lie, and it now remains to connect these roads by regrading the upper road so as to make it passable for teams, and an appropriation which will make it possible to complete this

during the coming period will be a most profitable investment for the Government.

In Kau the road from Hilea to Pahala was completed in April. A survey has been made for a change in the location of a section of the old road between the Charley Wall bridge and the Achong bridge. This is necessary to overcome a very steep grade which has a number of times been made impassable by the cutting of storm water, and should be done as soon as practicable.

NEW ROAD, PUNA.

A road has been laid out from the nine mile post on the Volcano road to strike the center of the Puna District, connecting with a road already made by R. Rycroft from Pohoiki; construction began in February, 1895, and continued until the prisoners were transferred to the Volcano Road in the middle of October. 12,500 feet or 2.37 miles have been completed at a cost of $3,052.44 per mile. The work has been done entirely by prison labor, except what was required for the traction engine, and blacksmith shop. The total number of days work of prisoners used on this work is 8376. The detail of expenditure is as follows:

Survey	$ 295 43	
Boarding House	626 90	
Camp	684 69	
Office and Supt	896 00	
Prison Lunas	1.401 00	
Powder, Fuse, etc	1,018 83	
Engine	135 96	
Tools and Equipment	1,680 65	
Stable	787 56	
Blacksmith Shop	571 26	
Volcano Road	120 75	
		$ 8,219 03

The last item was an amount which the Puna Road Board spent from this appropriation. Tools and equipment includes $865.00 paid for a rock crusher which has just arrived but has not been used. These two amounts are not included in the cost per mile given above.

The appropriation for road to Kaiwiki homesteads was a special appropriation to pay for a road which had been previously constructed by the Hilo Sugar Co., and by agreement turned over to the Government.

In addition to this a road was very much needed through the homestead tract, and this has been partly made from the appropriation for Reconstruction Roads Hilo. The amount expended under this bureau from this appropriation, is divided as follows :

Expense of survey Honohina to Maulua, Umauma, Onomea and Hakalau and Waiakea Beach roads	$ 144 86	
Maulua	310 00	
Awapuhi	1,234 56	
Kaiwiki Homesteads	748 75	
		$ 2,438 17

A section of 900 feet of new grade in Maulua has been made partly from this appropriation and partly from the appropriation made for the purpose at the special session of the Legislature; and work in this gulch would have been continued if funds had been available.

In laying out and constructing the new roads, the good judgment and experience of Mr. W. W. Bruner have been invaluable. His salary and a portion of his expenses have been paid by the Survey Department.

It would be better to provide an appropriation under this bureau to cover his salary and expenses.

ADDITIONS TO WATER WORKS.

A very important improvement has been made in the erection of a pumping plant for the city of Honolulu.

The plant consists of a compound double acting Blake Pump, with boilers and smoke stack furnished and erected by the Honolulu Iron Works Co.; a fine brick and stone building; two artesian wells; a reservoir not yet complete; and 18-inch cast iron pipe to connect pump and reservoir.

The pump was guaranteed to raise 100,000 gallons of water per hour against a head of 70 pounds. In the trial made May 20th and 21st, the actual discharge averaged 123,821 gallons per hour for 24 hours, and there is no question but that the pump can be run at a higher speed if required. A duty was developed of 109,607,496 feet pounds per 1000 pounds of water evaporated.

A central location for the pumping station was secured at the corner of Beretania and Alapai streets and a reservoir site was also secured near Alapai street on the slope of Punchbowl hill, 1600 feet distant from the pumping station, at an elevation of 170 feet above sea level.

Two 10-inch wells were sunk by McCandless Bros. under contract; one to a depth of 615 feet. the other 580 feet. They were cased with heavy drive pipe to the rock. The flow of each well was measured before connecting the pump and found to be 129,000 gallons per hour, or 258,000, for both. The water from these wells has also been analyzed by Mr. J. T. Crawley, and the

following is his report which was made during the cholera epidemic.

LABORATORY OF THE HAWAIIAN AGRICULTURAL EXPERIMENT STATION.

HONOLULU, Sept. 6th, 1895.

Following is the analysis of water from the new pumping plant, corner Beretania and Alapai streets :

	Grains per Gallon of 70,000 Grains.	Parts per 100.000.
Total solids	18.4	26.3
Loss on ignition	3.7	5.3
Iron and Alumina (Fe_2O_3, Al_2O_3)	1.0	1.4
Silica (SiO_2)	2.0	2.9
Lime (Ca O)	1.1	1.6
Magnesia (Mg O)	1.4	2.0
Sulphuric acid (S O)	0.2	.3
Carbonic acid (CO_2) total	8.7	12.4
Potash (K O)	0.8	1.1
Soda (Na_2O)	2.1	3.0
Chlorine (Cl_2)	4.8	6.9

	Parts per 1,000,000	
Free ammonia	0.14	
Albuminoid ammonia	.085	
Oxygen consumed	1.6	(Moist combustion process.)

On treating the clear water with sugar and exposing to light, there was a perceptible fungoid growth and milky appearance within 20 hours.

There is nothing notable in the mineral constitution with the exception of the rather high content of iron and alumina and chlorine.

The amount of free and albuminoid ammonia, considering the high content of chlorine, would make this a suspicious water if it were from a surface well, but being from a deep artesian source it leads to the conclusion that the organic matter may be from a vegetable source and therefore not injurious. In view of the present epidemic threatening the city, I cannot too strongly impress the necessity of boiling this water and filtering, when possible, before use. Dr. Lyons has already pointed out the fact in a previous report on some of the city waters, that water containing organic matter contains the food upon which the germs of pathogenic bacteria feed, and would furnish a proper culture medium for these germs. During contagious or infectious diseases this water should be boiled, and never used after long standing. Even in ordinary times filtration through a porous filter would be an advantage inasmuch as much of the organic matter would become oxydized into harmless products during the process.

Respectfully submitted,

(Signed) J. T. CRAWLEY.
Chemist.

The amounts expended are as follows:

Station Site	$ 2,705 50	
Reservoir Site	202 00	
Artesian Wells	9,717 91	
Pump House	8,571 38	
Pump and Boilers	30,500 00	
Reservoirs	3,252 11	
18-inch Pipe	3,764 43	
		$58,713 33

NEW WHARVES AND SEA WALL.

Nuuanu St. and Sorenson's wharves were completed early in the year and Sorenson's wharf has been covered with an asphaltum surface. Sorenson's wharf was covered with block pavement and the asphaltum was put on with a view to keep out rain water which would tend to rot the blocks.

A sea wall of coral blocks has been constructed at the head of the proposed Richards Street slip, and extended up to Punchbowl St. so as to enclose the area to be filled, in dredging the slip. Test borings were also made every 50 feet over the area to be excavated. 19 holes were sunk to a depth of 25 to 28 feet below water level. Layers of sand, gravel, soft coral, hard coral, and in some cases black rock were found varying in thickness and depth; with the general result that a satisfactory demonstration was made that there will be no difficulty in excavating the slip with the hydraulic dredger to a depth varying from 26 feet at the line of the Pacific Mail Wharf to 15 feet at the head of the slip. To complete the excavation of the lower hard coral I apprehend there will be no serious difficulty in loosening the rock by blasting, and removing it with the clam shell dredger; the small debris being finally removed by the suction dredger. This slip is very much needed for the accommodation of the large ocean steamers, and it is to be hoped provision will be made to begin the work at an early date.

In October, the dredger began work on the Ewa side of the harbor, excavating what may be called the Youman's slip. This excavation will be extended towards the mouth of Nuuanu stream at a depth of 8 feet. Up

to December 31st, 9000 yards of material were excavated and delivered, part on the old Chinese theatre lot and part on the Queen street extension. The material is chiefly black sand and gravel and makes excellent filling.

Following are the amounts expended:

Nuuanu Street Wharf	$ 556 34	
Sorenson's Wharf	753 05	
Retaining Wall, Richards Street	2,340 88	
Test Borings	403 44	
Diving Suit	225 00	
		$ 4,278 71

DREDGING YOUMAN'S SLIP.

Labor	$2,994 75	
Fuel	1,470 00	
Repairs	2,190 85	
Expense	343 91	
		$ 6,999 51
		$11,278 22

The item of repairs on the dredger looks large. It is explained by saying that it became necessary to renew 400 feet of discharge pipe, a large number of rubber connections and the main driving belt. These items amounted to $1.686.00. The pontoon pipes are becoming badly worn and rusted through, and a large proportion of them must be renewed before long. It will be also necessary to renew the tubes in the steam boilers within a few months.

NEW PILE DRIVER.

The floating pile driver for which an appropriation was asked in 1894 has been constructed at a cost of $1,373.20. The hull is 38x16 and 4 feet 9 inches deep. The derrick is of sufficient height to allow the hammer to be raised 39 feet clear above the deck.

RETAINING WALL NUUANU STREAM.

Work has been begun on the Waikiki side of the stream and will be pushed forward as rapidly as circumstances will permit. Great pains are taken to guard against the foundations being undermined by scouring floods. An excavation is made as deep as practicable at low tide, and beneath the base proper of the wall a layer of rock is placed which will form an apron projecting about two feet in front of the wall. The base of the wall is five feet thick, and an outside batter of six inches to every foot in height is given for the first three feet; above that three inches to the foot. The wall will be finished with a parapet wall of masonry standing 30 inches above the level of the street to be made along the stream, and a sidewalk next to the stream will prevent teams from getting too close to the margin.

HILO FIRE DEPARTMENT.

A two story engine house has been built by contract for the Hilo Fire Department. It is 56x26 feet with a cupola for the bell on the front gable and a hose tower in the rear. A convenient hall for meetings is finished off in the second story.

NEW LAUNDRIES.

A contract has been let to Mr. H. Defries for the construction of a 20-room wash house at Iwilei on land leased from Mr. J. Ena. The length of the whole building is 360 feet, width 19 feet, of which 12 feet is covered with concrete floor, draining into an open gutter which discharges into the sea. A drying floor of coral, rolled down with the steam roller has been made 60 feet wide, and over this frames are erected upon which clothes lines can be stretched. Instead of allowing each washman to have his own furnace for boiling water, a steam boiler will be erected and steam furnished for heating purposes. The amounts expended so far are:

Coral floor	$1,684 60	
Concrete floor	974 40	
Piping	9 65	
Building	18 15	
Six months rent	300 00	
		$ 2,986 80

The contract price for constructing the building is $2,905.

COMPLETION OF NEW MARKET.

The cholera epidemic compelled the abandonment of the old fish market with its unsanitary surroundings, and the new market has been fitted up and occupied. A concrete floor has been laid through the middle section of the building, so graded that it can be flushed in any part and the water will be carried in open drains to the end of the building, and there discharged into a pipe drain which carries it to the sea. The area covered by the concrete floor is divided into 80 stalls with proper

alleyways between the different sections; each stall having its counter fronting on an alleyway. One-half of the counters are covered with marble slabs, for meat and fish, and the other half with sheet zinc over wood, for vegetables, poultry, etc. The floor in the two wings of the building outside of the concrete portion has been macadamized with Punchbowl rock; the grounds around the building have been graded and planted with grass and protected by a slight fence. A curb of native stone has been put around the whole block, and trees and shrubs will be planted to make the place ornamental. The detail of expenditure is as follows:

Concrete Floor and Drains	$3,572 18	
Water Pipe and Laying	280 41	
Counters	3,352 20	
Painting	1,284 03	
Grading	900 90	
Curb	475 70	
Track and Wharf	394 23	
Miscellaneous	217 58	
		$10,477 23

NEW SCHOOL-HOUSES.

Five new school-houses have been built for the Board of Education and contracts made for two more. In every case a contract has been made for the construction of the school-house, and usually there has been some additional work, such as fencing water closets, etc., done outside of the contract. The amounts expended are:

Ewa School-house	$1,831 33
Ulupalakua School-house	1,969 67

Holualoa School-house.....	1,953 01	
Kaupahulua School-house.....	2,121 64	
Kailua School-house	904 84	
Olaa School-house	150 00	
		$ 8,930 49

The Olaa school-house is not complete. The contract price is $749. A contract has also been made for the construction of a similar school-house at Wainiha, Kauai, for $700.

WHARF AT NAPOOPOO.

A boat wharf has been made at Napoopoo at a cost of $600.00. A little additional expense is required to remove some rocks in the water which might be dangerous to boats with a swell coming in.

BUILDING PERMITS.

There have been issued during the year 115 building permits, the fees for which amounting to $575.00 have been turned in to the Interior Office as Government Realizations.

RECOMMENDATIONS.

It is hardly necessary to add very much to the recommendations that have been made in connection with the work done, but I would like to draw attention to some requirements of special importance.

HARBOR IMPROVEMENT.

With the addition of two large wharves within two years, we have hardly kept pace with the increased demand for wharf room. Provision should by all means be made to carry out at least a portion of the plan for

steamer berths at the foot of Richards street. As mentioned in my report in 1894, the plan is to excavate a slip 150 feet wide and 440 feet long and build a wharf on each side. If this is too much to provide for in one period half of the excavation can be made and a wharf built on one side. This will give one good berth for an ocean steamer, and the other can be made later on. $50,000.00 will accomplish this. At least one more wharf should also be constructed on the west side of the harbor, as recommended in the report for 1894.

Another much needed harbor improvement is a 50 ton derrick to be used in handling steamers' boilers and other heavy pieces of machinery. A suitable place for the erection of this derrick would be the outer end of Sorenson's wharf. Additional piles would be required to support the foundations. A Shear's derrick 90 feet high with proper guys would answer all requirements. $6,000.00 will cover the cost.

NEW WHARF, HILO.

I can only repeat what I have said in former reports. Increased wharf accommodation is needed at Hilo and fully warranted by the business of the port. A wharf can be built on the Waiakea side of the bay on which in ordinary weather, vessels could discharge freight without using boats or scows. To make it a secure place for a large vessel to lie alongside a wharf at all times will require the construction of a breakwater on the reef extending north from Cocoanut island. Doubtless it will pay to do this at some time. The facilities for landing freight on the town side of the bay should however be improved either by the extension of the present wharf

seaward or the construction of a new wharf running out directly from the beach.

LIGHTHOUSES.

The improvement of the harbor light, and the erection of a light on Diamond Head which were provided for in 1894, have not been reached during the period and it is desirable that the provision should be continued.

NEW BUILDINGS.—CENTRAL FIRE STATION.

The necessity for this building has been repeatedly urged in former reports and by the Fire Commissioners. Plans are being prepared for a building to be erected on the lot at corner of Beretania and Fort streets, to contain four engine rooms in the lower story and suitable sleeping rooms in the second story. The arrangement of the building is satisfactory to the Fire Department, and the exterior will present a creditable appearance. It is proposed to construct the walls of brick with native stone trimmings. It is estimated that $30,000 will be ample to complete the building.

FIRE PROOF VAULT.

In the last appropriation bill an item was included in the appropriation for Repairs Furniture and Additions to Government Buildings for a fire proof vault for the Survey Department. I would suggest that the purpose can be accomplished by making fire proof the small room adjoining the Survey Department lately occupied by the Government Land Agent. The wooden floor and ceiling can be replaced by brick arches, and the opening closed with double fire proof shutters. This will

give a commodious room where maps that are required for daily inspection may be kept and yet be practically safe in case the building should burn.

COURT HOUSES AND JAILS.

The Court Houses at Honokaa and Kona, the Jailors' house N. Kohala and the Jail at Hilo are still among the requirements.

NEW ROADS.

No improvement seems more important and no investment more profitable than good roads through fertile districts. Below is a comprehensive estimate by W. W. Bruner of the cost of proposed roads on Hawaii and Maui which will on Hawaii practicably complete the trunk lines through the fertile districts; and on Maui add largely to the facilities for travel and transportation.

ESTIMATED COST OF COMPLETING ROADS ON HAWAII.

North Kona	*Feet.*	*Feet Wide.*	
Main and upper road from Huehue running south	7,000	8	
Same continued to Konawaena	85,000	16	
Kailua road remaining	3,000	16	
Kohanaiki road	6,000	8	
Total, 88,000 ft. of 16 ft. road			
13,000 " " 8 " "			
Will require			$ 60,000 00
South Kona			
From Kona-waena to upper end Napoopoo road	15,000		

	Feet	*Feet wide*	
South Kona			
From Napoopoo road in Keei 1 to junction with old upper road in Keei 2	5,000		
Thence to Kalahiki road	27,550		
Total, 47,550 ft. upper road 16 ft. wide			
Also from Pahoehoe half way to Honomalino		16	
Balance to Honomalino		8	
Total required for South Kona			$ 40,000 00
Kau			
Hilea and Pahala road from Wall bridge to Chong bridge			3,000 00
To connect with Punaluu			3,000 00
Puna (new road)			
All Hawaii prisoners 24 months at $900.00			20,000 00
Additional on contract			20,000 00
Total for Puna $40,000.			
This will finish road to Kalapana			
South Hilo.			
To complete road to Hakalau including bridges and abutments, and to pay for Honomu work			75,000 00
North Hilo.			
From Hakalau to Ookala			75,000 00
No prisoners to be used in North and South Hilo.			
Kohala.			
Waimea and Kohala road			12,000 00
Total for Hawaii			$308,000 00

ESTIMATED COST OF COMPLETING ROADS ON MAUI.

Lahaina and Wailuku road	12,000 00
Makena and Kula	15,000 00
Extension towards Makawao.....	10,000 00
	$ 37,000 00

If the funds can be provided there is no reason why the roads in the above estimate cannot be practically completed within two years from the time of beginning the work.

Respectfully submitted,

W. E. ROWELL,
Sup't of Public Works.

REPORT

OF THE

Superintendent of Water Works.

HONOLULU, H. I., December 31st, 1895.

J. A. KING, MINISTER OF THE INTERIOR;

SIR:—I have the honor of presenting my report as Superintendent of the Bureau of Water Works for Honolulu for the period from January 1st, 1895, to December 31st, 1895.

APPROPRIATIONS.

The appropriation balances of this Bureau for the period on December 31st, 1894, were as follows:

Running Expenses	$ 4,671 13
General Repairs	6,119 96
Repairs to Reservoirs	3,584 50
Improvements and Additions	85,330 72
Running Expenses Pumping Plant	5,000 00
	$104,706 31

EXPENDITURES.

The disbursements to December 31st, 1895, are as follows:

Running Expenses	$	4,018 54
General Repairs		5,207 37
Repairs to Reservoirs		1,552 21
Improvements and Additions		84,607 24
Running Expenses Pumping Plant		2,813 84
	$	98,199 20

UNEXPENDED BALANCES.

Running Expenses	$	652 59
General Repairs		912 59
Repairs to Reservoirs		2,032 29
Improvements and Additions		723 48
Running Expenses Pumping Plant		2,186 16
	$	6,507 11

REVENUE OF THE BUREAU.

The receipts of the Bureau during the twelve months were $43,996.85, which were received from the following sources:

City water rates	$	37,221 75
Shipping		4,803 00
Ten per cent. charges		1,191 30
Turning on water, and labor		321 25
Sale of taps, etc		559 55
	$	43,996 55

NEW PRIVILEGES.

During the above period one hundred and eighty-nine new privileges have been granted, rated as follows:

Ten at	$ 10 00	per	annum
One hundred and thirty-two at	15 00	"	"
Thirty-six at	25 00	"	"
One at	35 00	"	"
One at	40 00	"	"
Three at	50 00	"	"
One at	55 00	"	"
One at	60 00	"	"
One at	125 00	"	"

One free to Board of Health, South street extension.

Two free to Board of Education, viz.: Kalihi school-house, and Pauoa school-house.

WORK PERFORMED.

One hundred and fifty feet of eighteen inch cast iron pipe has been laid on Alapai street, connecting pump with main on Beretania street.

Ten thousand three hundred feet of twelve inch cast iron pipe, with all necessary gates and fittings, has been laid as follows:

Beretania, from Emma to Keaumoku street, 7,500 feet.

King, from Nuuanu to Liliha street, 2,800 feet.

Ten thousand eight hundred feet of eight inch cast iron pipe and thirty-two hundred feet of eight inch steel pipe with all necessary gates and fittings, has been laid as follows:

From Beretania, down Alapai, along King, down South, along Queen to Fort.

From King down Alakea, along city front, up Fort to Beretania street.

From Liliha out King, connecting with the six inch pipe.

Six thousand feet of six inch cast iron pipe has been laid along King street to Kamehameha IV. road; twenty-five hundred feet of six inch pipe has been laid on Kamehameha IV. road; seven hundred and fifty feet of six inch steel pipe has been laid on Kalihi road; seven hundred and fifty feet of old cast iron pipe has been cleaned and laid on Nakuina street; twelve hundred feet of six inch cast iron pipe taken from Beretania street has been cleaned and relaid on the Prison road; eight hundred and fifty feet of six inch steel pipe has been laid on Pensacola street connecting with the twelve inch on Beretania street.

FOUR INCH PIPE.

Five hundred feet of old cast iron pipe has been cleaned and laid at Diamond Head; thirty-five hundred feet of four inch steel pipe has been laid on Beckwith street from Punahou to Sea-View; eight hundred and fifty feet of four inch steel pipe has been laid on Piikoi street; six hundred feet of four inch steel pipe has been laid on Hassinger street; two thousand feet of four inch cast iron pipe taken up on Prison road has been cleaned and relaid at Iwilei; and four hundred feet of the same has been cleaned and relaid on Aala lane; ten hundred and fifty feet of four inch steel pipe has been laid on Notley street; twelve hundred and fifty feet of

four inch steel pipe has been laid on Nakuina street; four hundred feet has been laid on Wiloae; and one thousand feet of four inch steel pipe has been laid on Beckley street.

HYDRANTS.

During the period seventeen additional standing hydrants has been added to the system, making a hundred and one standing and ninety-three ground, and are placed as follows:

Nuuanu street, nine standing and seven ground.
Punchbowl street. three standing and one ground.
Queen street, six standing and two ground
Richard Street, two ground.
School street, seven standing.
Pensacola street, one standing and three ground.
Palace Walk, two standing.
Punahou street, three ground.
Smith street, two ground.
Thurston avenue, one standing.
Union street, three ground.
Vineyard street, one standing.
Waikiki street, one ground.
Keleiea street, one ground.
Wilder avenue, two ground.
Allen street, two ground.
Kekuinoa street, one standing.
Adams Lane, one ground.
Alakea street, four standing and one ground.
Alapai street, one standing.
Young street, one standing.
Emma street, five standing.

Fort street, eleven standing.
Beretania street, eight standing and eleven ground.
Hotel street, two standing and four ground.
Judd street, one standing and two ground.
Kapiolani street, three standing.
Kinau street, four standing and one ground.
King street, fourteen standing and twelve ground.
Lunalilo street, six ground.
Liliha street, five standing.
Maunakea street, six standing.
Makiki street, two ground.
Merchant street, two ground.
Miller street, two ground.
Old Waikiki, one ground.
Waikiki, five standing and two ground.
Smith Lane, one ground.
Kukui Lane, one ground.
Asylum Road, two ground.
Bushee Lane, one ground.
Keaumoku street, four ground.
Kewalo street, three ground.
Kukui street, one ground.
Iwilei, four ground.

PUMPING.

The long deferred and much needed pumping plant installed during last summer, at the corner of Beretania and Alapai streets, Honolulu, and furnished by the Honolulu Iron Works Company, under contract, is a great success and reflects much credit on both the makers of the pumps, Messrs. Geo. F. Blake & Co., New York, U. S. A., and the contractors who furnished and erected the whole plant of machinery.

As will be seen by the official reports, this plant has more than filled the requirements and conditions demanded in the Government Specifications, as to both duty and capacity trials; the quantity of water required being two million four hundred thousand gallons in twenty-four hours, and the easy performance of the pumps, of three million two hundred and twenty-five thousand gallons in twenty-four hours' work, consuming three tons of coal.

When the reservoir is completed, however, and a large main connecting reservoir and pump has been laid, I hope to be relieved of the hampering conditions now existing and consequent upon the danger of bursting the general mains. These pumps will show much more encouraging and economical results. During the cholera the pumps were worked sixty-six days, and the mains were flushed twice every week, during which time there was pumped one hundred and eighty-three million, four hundred and fifty seven thousand, seven hundred and seventy-six gallons of artesian water.

Had it not been for the cholera, I would not have required to run the pumps, as there has been all the water in the reservoirs required for the city's use this winter.

The two ten-inch artesian wells provided by the Government for this plant amply supply the pumps at their greatest capacity without vacuum on the suction, which I consider will greatly enhance the economy in working.

The P. G. pump at Makiki has been working a hundred and eighteen days during the period, and has pumped one hundred and fifty-three million seven hundred and fifty thousand gallons of water into Makiki

reservoir, and I am now giving them a general overhauling and repairing the foundations, and when finished they will be as good as ever and ready for work when required.

SPRINGS AND RESERVOIRS.

During the period all the springs and reservoirs have been thoroughly cleaned and new strainers added.

TRESTLE WORK.

The trestle work and dam at Luakaha have been thoroughly overhauled and repaired and are now in good condition.

The trestle work crossing the Nuuanu stream at Judd street has also been thoroughly overhauled and repaired and put in like good condition.

BUILDINGS.

The keeper's house at Luakaha, the Half-way House, and the Gate House, Nuuanu, have all been repaired, painted and put in good condition.

The reservoir keeper's house at Makiki has been reshingled and put in like good condition.

ARTESIAN WELLS.

There are two hundred and six wells in the Island of Oahu.

In the immediate vicinity of the City of Honolulu there are wells, which are located as follows :

1 Insane Asylum, Government.
1 Executive Building, "

1 Government Stables, Government.
1 Bishop High School, "
2 Beretania Street Pumping Station, Government.
1 Thomas Square, cor Waikiki road and King street, Government.
1 Makiki Pumping Station, Waikiki, Government.
1 Gulick Residence, Kalihi.
1 Waller's Brewery, "
1 Kamehameha School, Kalihi.
1 Mrs. Dominis, Palama.
2 Ah In's Rice Mills, "
1 James Campbell, Emma street.
1 Mrs. Foster. Nuuanu.
1 Hawaiian Hotel.
1 Queen's Hospital.
1 Mrs. Ward, King street.
1 A. Kraft. Makiki.
1 A. S. Wilcox, King street.
1 John Wright, "
1 J. I. Dowsett, "
1 Mrs. Vida, "
1 T. Cummins' land, "
1 J. B. Atherton, "
1 Kapiolani's Place, near Baseball Grounds.
1 Ice Works, Beretania street.
1 A. Herbert, Beretania street.
1 Lyman's, end of Beretania street.
1 Marques, Punahou.
1 Dillingham, "
1 Widemann, "
1 Spreckels, "
1 Bingham, "

1 Jaeger, Punahou.
1 Old King's Well, Punahou.
3 McCully, "
1 Goo Kim, Moiiliili.
1 Geo. Beckley, "
1 Henry Poor, "
3 Jas. Campbell, Waikiki.
1 Kapiolani. "

RECOMMENDATION.

I would respectfully recommend that an appropriation of Twenty Thousand Dollars ($20,000.00) be made for the purchase of five thousand feet of twelve-inch cast iron pipe, to be laid on Makiki street from the reservoir to Keaumoku street, to connect with the twelve-inch pipe on Beretania street. The eight-inch pipe taken up on Makiki street would be laid on King street, from Nuuanu street to Waikiki road, also, five thousand feet of eight inch cast iron pipe to be laid on Liliha street to connect with the twelve inch pipe on King street; there is only a four inch pipe on Liliha street at present. The six inch on Judd and the eight inch on School, both connect with the four inch on Liliha street: by laying an eight inch on Liliha street, the residents of Kalihi would have a better supply; they have very little water during the day time, owing to the friction and distance it has to travel.

Also for two thousand feet of six inch cast iron pipe to be laid on Merchant street, from Nuuanu to Richard street.

This amount would cover the expenses necessary for laying.

I would also ask for an appropriation of Five Thousand Dollars for the purchase of one hundred standing hydrants; this amount would place them in position.

I would also ask for an appropriation of Sixteen Thousand Dollars for the running expenses of the two pumping plants for the period of two years.

ESTIMATED ACTUAL REQUIREMENTS.

General Repairs	$ 12,000 00
Repairs to Reservoirs	8,000 00
Running Expenses	7,477 00
	$ 27,477 00

Estimated revenue for the coming period $100,000.

ESTIMATED RUNNING EXPENSES OF THE BUREAU OF HONOLULU WATER WORKS FOR THE PERIOD ENDING MARCH 31ST, 1898.

Rent of lands	$ 2,000 00
Horse feed and shoeing	1,440 00
Printing, advertising and stationery	1,000 00
Rent of telephones	832 00
800 feet hose	800 00
Tools	500 00
Horses	250 00
Break and repairs	180 00
Medical services and medicine for horses	100 00
Harness	125 00
Taps and stop-cocks	250 00
	$ 7,477 00

I have the honor to be,

Your obedient servant,

ANDREW BROWN,
Superintendent Honolulu Water Works.

REPORT

OF THE

CLERK OF THE MARKET.

HONOLULU, DECEMBER 31ST, 1895.

J. A. KING, MINISTER OF INTERIOR:

SIR:—I have the honor to submit herewith my report as Clerk of the Market, for the period extending from January 1st, 1895 to December 31st, 1895.

RECEIPTS.

Rent from stalls, tables and transient dealers .$3,893 05

RECOMMENDATIONS.

I would recommend that $2,500.00 be appropriated for running expenses and repairs to market for the period ending March 31st. 1898.

ESTIMATED RECEIPTS.

For the period ending March 31st, 1898.....$17,000 00

Respectfully submitted,

ANDREW BROWN,
Clerk of Market.

REPORT

OF THE

Board of Fire Commissioners.

J. A. KING, MINISTER OF THE INTERIOR:

SIR:—I have the honor to present herewith the report of the Board of Commissioners, Honolulu Fire Department, for the year ending December 31st, 1895, together with report of the Chief Engineer, covering same period, to which you are respectfully referred for a detailed account of the department.

The fire department as now constituted, consists exclusive of the Board of Commissioners and clerk, of the chief engineer, senior foreman, two foremen, two complete engine and hose companies and one chemical engine company, comprising in all a force of twenty-six uniformed men,

During the early part of the period the Commissioners deeming it wise and expedient to supersede China Engine Company with a regular force, terminated its agreement with said company, and on May 1st instituted in the Government premises at Maunakea and Pauahi streets, Chemical Engine Company No. 1, Station 3. The excellent results attained by this move

have more than met the expectations of the Commissioners.

Your attention is again respectfully called to the following recommendations set forth in the previous report of the Board: "The urgent necessity of a suitable building for a Central Station, as well as for the proper housing of the apparatus and men, was never more apparent than at present. The present quarters are rapidly falling to pieces, are unhealthy and too small for the purpose required. Plans have been prepared by the Superintendent of Public Works on the Government property at the corner of Beretania and Fort streets. The cost of the building as proposed will be $35,000.00, which sum the Commissioners respectfully request be appropriated for this purpose."

The Board would add that the conditions above stated have gradually grown worse, and in a short time the quarters will be absolutely untenantable.

"The Commissioners would also urge the passage of an Act giving the chief engineer power to enforce the removal of rubbish heaps and other inflammable material carelessly placed in proximity to buildings. At the present time there being no penalty for the neglect of this precaution, it is impossible to compel tenants to properly keep premises in a condition that will obviate the dangers arising from ash heaps, old boxes, etc., now existing,"

The improvements and extension of the department urgently recommended by the chief engineer in his report are heartily concurred in by the Commissioners, who earnestly request your favorable consideration and approval of same and other measures herein set forth.

In conclusion the Commissioners desire to reaffirm their confidence in the chief engineer and his associates in the department.

Respectfully submitted,

ANDREW BROWN,
Chairman.

ANDREW BROWN, ESQ.,

Chairman Board of Commissioners, Honolulu Fire Department,

SIR:—I hereby submit for your consideration, the following report of the Honolulu Fire Department for the year ending December 31st, 1895.

FIRE ALARMS.

During the year there have been a total of nineteen alarms caused as follows:

Explosion of kerosene oil lamps	2
Spontaneous combustion	1
Tobacco smoking	1
Rubbish	4
Incendiary	4
Matches	1
Lime	1
Unknown	3
False alarms	2

FIRES ACCORDING TO WARDS.

Wards.	*Fires.*	*Wards.*	*Fires.*
1	0	9	0
2	0	10	0
3	3	11	0
4	5	12	3
5	5	13	1
6	0	14	1
7	0	15	0
8	0	16	1

LOSSES BY FIRE—INSURANCE.

Total Loss	$24,415 00
Total amount insurance	18,700 00
Total loss paid by insurance	15,200 00
Total amount not covered by insurance	215 00

During the recent cholera epidemic the department was frequently called out by the Board of Health for the purpose of firing buildings in infected localities.

CHEMICAL NO. 1—STATION 3.

Station 3 was established May 1st, 1895, by placing the chemical engine with a full paid company in the Government premises formerly occupied by China Engine Company No. 5.

Engine No. 2 was put into service at Station 2 to replace the vacancy created by the removal of chemical Engine.

This change has materially increased the efficiency of the department; principally for the reason that immediate response to alarms in the vicinity of Station 3 is

necessary, where the inflammable nature and density of buildings demand the extinguishment of a fire in its incipiency in order to avert a disastrous conflagration.

To illustrate this: on September 26th, a still alarm was turned into Station 3, the fire being located in an alley way off Maunakea street in a two story building, and well under way when the chemical arrived; immediate and effective action of the chemical in this densely built place undoubtedly prevented a destructive fire.

Other experiences of like nature have occurred since the inauguration of the station, and in the interest of the city I cannot too highly commend the Board of Commissioners for having made this change.

NEW SUPPLY WAGON.

The old hook and ladder truck has been converted into a first-class supply wagon, capable of carrying 1,600 feet of hose, two Holloway extinguishers and all necessary appliances at the small cost of $260.75.

NEW APPARATUS.

We have added to the apparatus as follows:

2 Eastman holders.
1 ball nozzle.
1 Siamese two-way vacuum nozzle.
1 Gamewell fire alarm gong.
1 chemical ball nozzle.
4 lengths suction hose.

In compliance with the request of the Minister of the Interior and approval of the Board of Commissioners, the Hilo Fire Department has been furnished during

the past year from the property of this department with one new boiler for Clapp & Jones engine, one-half wheel hose reel and one set grate bars; also the Road Supervisor of Honolulu with fifty feet of two and one-half inch hose.

The manager of Honolulu Ice Works has been loaned, on order of the Board, ½ wheel hose reel on condition that same be kept in readiness for use in event of fire in that locality.

APPROPRIATIONS AND EXPENDITURES.

Balance appropriation running expenses, Jan. 1, 1895	$ 8.884 37
Balance appropriation pay roll, Jan. 1, 1895	19,650 00
Special " " " July, 1895	4,000 00
	$32.534 37

RECAPITULATION OF EXPENDITURES.

Pay roll	$17,345 00
Rent Bell Tower premises	1,080 00
Horse feed	1.398 59
Horse shoeing	210 50
Telephone service	234 00
Apparatus (repairs)	817 00
Harness (repairs)	93 00
Buildings (repairs)	51 29
Fuel	156 25
Veterinary service	27 50
Furniture and fixtures	105 25
New harness and snaps	206 85

New apparatus	1,049 69
Horses, 2	505 00
Extra labor	1,385 00
Supplies and sundries	1,014 17
Total	$25,735 09
Balance of appropriations	6,799 28

ROLL OF OFFICERS AND MEMBERS OF THE HONOLULU FIRE DEPARTMENT.

BOARD OF COMMISSIONERS.

Andrew Brown, *Chairman.*
Chas. Crozier.
J. H. Fisher.

Jas. H. Hunt.....Chief Engineer
Wm. R. Sims.....Secretary

ENGINE CO. NO. 1.—STATION 1.

Location—King street, between Alakea and Richard.

Frank May.....Foreman
P. Hughes.....Engineer
N. Boyle.....Driver
G. Maile.....Stoker
W. Desney.....Driver Hose Wagon
E. N. Voeller.....Hoseman
E. J. McCandless..... "
A. T. Smith..... "
A. Ferria.....Watch Boy

ENGINE Co. No. 2.—STATION 2.

Location—Union Street, near Hotel.

W. D. Hamilton ..... Senior Foreman
W. H. Bromley ..... Engineer
Tom Morrissey ..... Driver
J. Pigott ..... Stoker
Gus Morrissey ..... Driver Hose Wagon
E. L. Miller ..... Hoseman
W. McKay ..... "
E. L. Lawton ..... "
C. Birch ..... "
J. Silva ..... Watch Boy

CHEMICAL ENGINE Co. No. 1.—STATION 3.

Location—Corner Maunakea and Pauahi Streets.

W. O. Barnhard ..... Foreman and Engineer
M. J. Scully ..... Driver
G. Carlssen ..... Nozzleman
Tom Clarke ..... Stoker
Eli Howe ..... Watch Boy
John Clarke ..... Hydrantman

RECOMMENDATIONS.

I deem the following recommendations of vital importance for the proper protection of property from fire in this city.

STATION ON THE PLAINS.

I would again respectfully call your attention to the necessity of establishing a fire company on the "plains" in the vicinity of the old Base Ball grounds. The great

value of the improved property thereon and the material of which most of the buildings are composed, render this move one of imperative necessity. Any of the companies as now located, are required to make a run of two miles to reach that portion of the city. It is therefore obvious that all chance of saving property has past by the time the companies reach the ground.

For this purpose I consider that a chemical engine would be much more serviceable and economical than a steamer.

NEW SUPPLY WAGON.

I would strongly urge placing the new supply wagon in commission. This will require the employment of a driver and seven hosemen, and the purchase of two horses, set of harness and two Holloway Extinquishers. It will allow dividing the city into districts of service for each company and enable me to leave a fully equipped company in the heart of the city in event of being called out into the suburbs. Owing to the great distance between hydrants in the outlying districts, neither of the present hose wagons carry sufficient hose, consequently when a fire occurs in these districts I am compelled to take both hose wagons out and leave the main portion of the city entirely unprotected.

In addition to the foregoing reasons the present organization has but seven movable men when in action, which number is totally insufficient to handle a fire of ordinary size. In manning this wagon the membership of the department will not be increased beyond the present actual requirements for the proper protection of life and property in this city. Further, it will also en-

able me to increase the liberty of the men, who are at present allowed only thirty hours in each month.

I would also recommend that the wages of the hosemen be increased from $40. to $50. per month. I believe that this would materially enhance the effectiveness of the service.

The addition of 100 three-way hydrants to the present system would greatly facilitate rapidity of work at fires. This improvement is particularly required on the plains.

In closing this report I wish to renew my thanks to the Board of Commissioners for the active interest manifested in all matters pertaining to the department.

I also desire to express my thanks to the officers and men of the department for the able and efficient manner in which they have executed their work, and the personal interest they have displayed under all circumstances to protect the city against losses by fire.

Respectfully submitted,

J. H. HUNT,
Chief, Honolulu Fire Department.

ESTIMATE MATERIAL AND SUPPLIES, HONOLULU FIRE DEPARTMENT—2 YEARS.

Rent	$ 2,160 00
Horse feed	3,127 00
Horse shoeing	600 00
Telephone service	588 00
Veterinary service	150 00
Two horses	500 00
New apparatus	1,000 00

New harness	250 00	
Apparatus repairs	1,500 00	
Harness repairs	200 00	
Kerosene oil	425 00	
Fuel	300 00	
Hose	1,000 00	
Fixtures and furniture	300 00	
Supplies and sundries	2,500 00	
		$14,600 00

ESTIMATE OF PAY ROLL, HONOLULU FIRE DEPARTMENT—2 YEARS.

Chief Engineer	$ 4,200 00	
Two Foremen	3,000 00	
Three Engineers	8,640 00	
Five Drivers	8,400 00	
Three Stokers	3,600 00	
Seven Hosemen	6,720 00	
One Hydrantman	1,800 00	
One Nozzleman	1,320 00	
Secretary	600 00	
Three Watch Boys	1,440 00	
		$39,720 00
Proposed increase in wages of hosemen from $40 to $50 per month	1,680 00	
The department as now constituted requires a relief driver at	1,800 00	
		$43,200 00

ESTIMATE OF REQUIREMENTS FOR NEW SUPPLY WAGON—2 YEARS.

Two horses	$ 500 00	
Harness and Hangers	130 00	
Horse feed	480 00	
Horse shoeing	100 00	
Furniture and fixtures	120 00	
Sundries	200 00	
		$ 1,530 00

ESTIMATE OF PAY ROLL FOR SAME.

One driver	$ 1,800 00	
Six hosemen	5,760 00	
		$ 7,560 00
		$ 9,090 00

The equipment of above is considered more essential to the department than proposed station on the plains.

PROPOSED CHEMICAL STATION ON THE PLAINS.—ESTIMATE OF BUILDING, APPARATUS, MATERIAL AND SUPPLIES—2 YEARS.

Cost of building (estimated by Supt. Pub. Wks)		$ 2,500 00
Chemical engine	$ 2,800 00	
Two horses	500 00	
Harness and hangers	130 00	
Horse feed	480 00	
Horse shoeing	100 00	
Telephone service	156 00	
Fixtures and furniture	100 00	
Supplies and sundries	400 00	
		$ 4,666 00

ESTIMATE OF PAY ROLL FOR SAME.

One Engineer and Foreman	$ 2,888 00	
One Driver.....	1,800 00	
One Nozzleman.....	1,200 00	
One Stoker.....	1,200 00	
One Watch Boy	480 00	
		$ 7,560 00
		$14,726 00

REPORT

OF THE

ROAD SUPERVISOR.

HONOLULU, H. I, December 31, 1895.

J. A. KING, MINISTER OF THE INTERIOR:

SIR:—I beg leave to submit herewith my yearly report showing the work done, and the amount disbursed by this Bureau during the year beginning January 1st, 1895 and ending December 31st, 1895.

The amount which has been expended for street purposes during the year are as per schedule enclosed:

ROAD CONSTRUCTION.

Halekauila street construction from Alakea to Richard street has been graded and finished.

Beretania street from Punahou to McCully street has been macadamized, graded and finished.

Queen street from Richard street to Kakaako road has been graded and finished.

Kekaulike street coral bed has been flattened and the work is not finished.

Richard street from Halekauila to Queen street has been graded and finished.

Hassinger avenue from Pensacola to Piikoi street has been graded, and rounded with dirt and finished.

Kamoiliili road from McCully street to Kamoiliili has been graded but not finished.

You will observe that a great deal of road repairs has been done during the year, this has been caused by recent heavy storms and the road wearing out.

SIDEWALK REPAIRS.

Sidewalk repairs have been done by the Government. Not being able to compel land owners to fix their sidewalks, and I find it hard to collect the amount due against them, therefore, the amount of $224.62 has been expended by the Government and unpaid by the property owners. And in this matter I wish to be instructed what to do.

CULVERTS.

Culverts of various sizes have been built of bricks, stone and lumber, and costs of such culverts and bridges are given herein as per schedule enclosed.

Ditches have been constantly kept in good order and repaired.

Beach road has been constructed and not finished. The amount of $7,500.00 appropriated is not sufficient to carry on the work to finish this road, the amount of expenditure is $6,833.07, leaving a balance of $666.73; therefore, I would ask that the sum of $4,500.00 be appropriated for this road.

All proposed new roads you are familiar with, and in a position to know exactly what is needed.

Hoping my report of 1895 will meet with your approval,

I have the honor to be

Your most obedient servant,

W. H. CUMMINGS,
Road Supervisor, Honolulu.

REPORT ROAD SUPERVISOR OF HONOLULU FROM JANUARY 1ST, 1895, TO DECEMBER 31ST, 1895.

QUARRIES.

Kamoiliili quarry	$ 9,928 50	
Kamehameha "	1,652 20	
Iwilei "	407 10	
Hackfeld "	272 78	
Kalihi "	102 59	
Emma street "	83 68	
Waikiki	9 50	
		$ 12,456 35

STREET CONSTRUCTION.

Halekauila street	$ 112 03	
Beretania "	2,429 45	
Queen "	2,475 52	
Kekaulike "	1,010 74	
Miller "	328 36	
Richard "	188 72	
Hassinger avenue	74 17	
Kamoiliili road	60 22	
		6,679 21

ROAD REPAIRS.

Adams lane	$ 9 00
Alapai street	53 15
Alakea "	44 92
Allen "	6 00
Asylum road	1 00
Beretania street	148 76
Bethel "	8 00
Chaplain lane	2 00
Diamond Head road	308 13
Emma street	38 00
Esplanade	3 00
Fort street	907 88½
Hotel "	101 95
Hackfeld street	15 00
Iwilei road	819 00
Judd street	50 24
Kalihi road	239 79
King street	4,129 33
Kukui "	1 00
Kahauiki road	1,069 86
Kinau street	10 15
Kuakini "	167 42
Kakaako road	41 00
Kamoiliili "	17 86
Kawaiahao lane	12 00
Kilauea street	2 00
Kapiolani "	10 62
Likelike "	8 30
Likelike wharf road	1 00
Liliha street	504 85
Lunalilo "	1 00
Moanalua road	221 89

Manoa valley road	$	90 98
Metcalf street		699 88
Maunakea "		55 00
Merchant "		10 00
Miller "		27 00
Mililani "		4 00
Nuuanu Pali road		328 50
Nuuanu street		473 00
Oceanic wharf		4 00
Punahou street		132 50
Peterson lane		40 40
Palama road		193 03
Pensacola street		9 50
Punchbowl "		726 42
Pauahi "		14 00
Puunui road		70 96
Pauoa Valley road		70 68
Queen street		835 25
" " Wharf road		36 00
Richard street		109 32
South "		3 00
School "		223 05
Sheridan "		11 00
Smith "		56 15
Stable and Yard road		247 06
Tantalus road		23 75
Thurston avenue		8 00
Union street		7 00
Vineyard street		7 00
Victoria "		15 00
Waikiki road		308 53
Waialae "		16 75
Wilder avenue		5 00
Wyllie street		6 00

Young street	$	33 27	
Kamoiliili track		232 47	
Kalihi Rifle Range		51 45	
Executive Building Grounds		57 00	
Judicial " "		12 65	
Tram Car		1 50	
Quarantine Station		15 31	
Kerosene Oil House		7 00	
Fish Market		4 00	
Wash House		21 00	
			$ 33,332 02½

BRIDGES AND CULVERTS.

Kakaako bridge	$	2 75	
Kahauiki "		151 00	
King street "		1 50	
Hobron lane "		6 92	
Pauoa road "		33 42	
School street "		477 68	
Smith " "		9 00	
Waialae road "		79 31	
Wyllie street "		35 44	
			797 02
Allen street culvert	$	322 88	
Beckley " "		25 00	
Diamond Head "		105 88	
Fort street "		7 00	
Hackfeld street "		6 00	
Iwilei road "		7 42	
Kalihi road "		192 27	
Kapiolani street "		51 66	
Kamoiliili road "		29 57	
King street "		206 12	
Liliha street "		7 60	

Moanalua road	culvert	$	648 29	
Metcalf street	"		91 68	
Prospect "	"		8 00	
Palama road	"		101 70	
School street	"		3 75	
Sheridan street	"		19 30	
Queen "	"		607 61	
Wilder avenue	"		637 74	
West Kalihi road	"		3 50	
Kahauiki "	"		88 60	
Fort street crossing	"		99 60	
Queen " "	"		94 40	
				$ 37,494 06½

DITCHES CLEANING.

Punahou	$	101 00
Punchbowl		139 25
Mrs. Ward		24 50
Pauoa road		7 00
Waikiki		35 75
		307 50

DUMPS.

Esplanade lot		299 10
Fort street		38 00
King "		9 96
Miller "		42 15
South "		549 45
		948 74

SIDEWALK REPAIRS.

Alakea street	$	25 00
Beretania "		24 00
Emma "		47 00

Fort	street	$	3 00	
Hotel	"		13 00	
King	"		31 00	
Miller	"		25 12	
Maunakea	"		22 00	
Pauahi	"		4 00	
Richard	"		2 00	
Smith	"		4 00	
Queen	"		44 50	
				$ 244 62
Punchbowl street rentention wall				44 92

WEEDING STREETS.

Artesian	street	$	9 24
Bingham	"		25 41
Beckwith	"		6 98
Beretania	"		2 00
Green	"		5 00
Hobron	lane		10 00
Keaumoku	street		19 82
Kauluwela	"		4 62
Kapiolani	"		2 31
Kinau	"		50 49
Liliha	"		6 98
Lunalilo	"		50 81
Makiki	"		65 27
Nuuanu	"		1 00
Moanalua	road		13 86
McCully	street		4 62
Pensacola	"		9 62
Piikoi	"		31 41
Punahou	"		12 31
Sheridan	"		16 00
Union	"		2 00

Thurston avenue	$ 2 31	
Victoria street	4 62	
Wilder avenue	26 17	
Wyllie street	23 00	
Young "	63 12	
		$ 468 37

SUNDRIES.

Cleaning streets	$ 2,370 05	
Fuel, locomotive	56 40	
" steam roller	823 20	
Harness repairs	844 05	
Horse feed	6,415 37	
Horse shoeing	970 33	
Horse roller repairs	7 00	
Live stock	1,500 00	
Locomotive repairs	61 35	
Makiki sand quarry	5 04	
Office expense	63 40	
Powder and fuse	761 94	
Stables and yard	2,330 61	
Steam roller repairs	832 09	
Sundry streets	3,417 57	
Shops	261 15½	
Sprinkling streets	731 50	
Tools and implements	3,797 64	
Transporting stone	1,633 57	
Wagons and carts	3,076 48	
		26,709 09
Total		$ 69,446 96½
Beach road, appropriation		$ 7,500 00
Beach road, expended		6,833 07
Balance		$ 666 93

REPORT

OF THE

BUREAU OF CONVEYANCES.

HONOLULU, H. I., Dec. 31st, 1895.

J. A. KING, MINISTER OF INTERIOR,

SIR:—The slight improvement in the business of this bureau in 1894, as shown in my annual report, was, evidently, but the forerunner of activity, for I am pleased to be able to report still further improvement in the revenue of the office for the year 1895, notwithstanding the periods of unrest and interruption which gave us in January and September the smallest income of any two months since my incumbency.

The following comparative table, showing division of office work, may be of interest:

SOURCE OF REVENUE.	1894.	1895.
Received from recording fees	$ 7,416 50	$ 8,651 50
" " search "	67 75	80 50
" " certified copies miscel. insts.	297 00	411 00
" " acknowledgments	27 00	26 00
" " copies of R. P. and L. C. A.	399 50	196 50
Total	$ 8,207 75	$ 9,365 50

The heaviest months' business were those of May, June and July, during which, not only the whole office force were engaged in copying, but the indexers on back records were interrupted in their work and pressed for days at a time into recording service. While this of necessity has hindered the completion of the back index work, which I hoped to have had finished by this time—it was indeed fortunate that the office had these two helpers to call upon in such an emergency, otherwise, from the limitation of the office of three copyists, and each at fixed monthly pay, as was done at the last regular session, the work of this bureau would have been blocked for months, and the public put to serious inconvenience.

I sincerely hope that this mistake of limiting the copyist force to the lowest possible number and at stated salaries, without a dollar's provision for contingencies that arise during the busy months of the year will not be repeated at the next consideration of appropriations for the working of this bureau. With the close of March the back indexing work will be about completed and we will be reduced to our regulation copying corps thereafter The indications bid fair for a continuance of the activity experienced this past year, with possibly considerable increase. I trust the appropriation will be such as to allow expansion or contraction of helpers as the work may demand, as in any well regulated business concern.

Basing an estimate for the coming biennial period upon the work of last year will give a revenue of $18,000.

The estimated expenditures for same period are $15,025, divided as follows:

Salaries of Registrar $5,000 and Deputy $3,600..	$ 8,600
For pay of copyists.....	6,000
Incidentals	425
	$ 15,025

The above provision is on the supposition of continuance of the present system in the working of the office, though it is possible the special committee appointed to report upon an improved system or method of transfers to the coming Legislature may require changes both in incidentals and working force.

Nothing new has developed during the past year to alter the several suggestions made in my former reports for efficiency of our records and saving of time to searchers.

I would, however, again call attention to the advisability of looking into certain sections of the Stamp Act for the better protection of the Government in transfers for "nominal" considerations, and a penalty provision for the re-use of revenue stamps.

Respectfully submitted,

THOMAS G. THRUM,
Registrar of Conveyances.

REPORT

OF

SECRETARY OF THE BUREAU OF IMMIGRATION.

J. A. KING, MINISTER OF INTERIOR AND PRESIDENT OF THE BUREAU OF IMMIGRATION:

SIR:—I have the honor to submit herewith the report of the Bureau of Immigration for the year ending December 31st, 1895.

BOARD OF IMMIGRATION.

The Board of Immigration consists of:

Minister of Interior	President
J. B. Atherton	Member
Jas. G. Spencer	"
Jos. Marsden	"
Jno. Carden	"
D. B. Smith	"

Fourteen meetings of the Board were held during the year as follows: January 4, February 12 and 18, March 21, April 26, May 29, August 8, 10 and 23, September 19, October 1 and 25, November 20, December 17. At these

different meetings applications for laborers were discussed as well as immigration in general. The total number of applications for laborers approved during the period was:

Chinese 2,441
Japanese 3,083

PORTUGUESE IMMIGRATION.

The S. S. Braunfels arrived April 4th with Portuguese as follows:

Men.	*Women.*	*Children.*
325	153	245

Within a week of their arrival they were all shipped to various plantations. The shipment was a very expensive one to the planters.

CHINESE IMMIGRATION.

At a meeting of the Board held January 4th, a new form of agreement between the Board and Chinese laborers was introduced. It was thoroughly discussed, and with a few amendments approved. The general terms upon which Chinese laborers have been coming in during the year in accordance with the action of the Board, are as follows:

1. Free passage for the laborers from their homes in China via Kongkong to Honolulu, including lodging and food in Hongkong waiting departure of steamer for Honolulu.

2. Free lodging and food in Honolulu until they

proceed to plantation where agreement is to be carried out.

3. Free passage from Honolulu to plantation.

4. Laborer is guaranteed the full protection of the laws of the Hawaiian Islands.

5. Wages and bonus under a three years' agreement $450.00 U. S. gold coin; under a two years' agreement $276.00 U. S. gold coin.

6. Free lodging, firewood and water while on plantation, but no rations.

7. A day's labor is ten hours in the field or twelve hours in the sugar factory.

8. If called upon the laborer has to work during the night and rest during the day.

9. A month's labor is twenty-six days.

10. Overtime exceeding thirty minutes is paid for at the rate of ten cents per hour.

11. No work is required on Sundays, or holidays recognized by the Hawaiian Government, or during the observance of the Chinese New Year's Day.

12. A deduction of $1.50 per month is made from the wages of the first twenty-four months, which sum is paid into the Hawaiian Government treasury, and there held at the credit of the laborer until such time as he elects to return to China, when the sum of $36 with accrued interest thereon will be applied to the payment of his return passage, and the balance, if any, given to him in cash.

13. The laborer has the option to cancel his agreement at any time before the expiration of same if he should wish to return to China. Should permission be granted by the British Government to Chinese to enter

into agreements before leaving Hongkong to work in this country, all labor agreements would be made between the laborers and the Hawaiian Government by its representative at Hongkong, and on arrival at Honolulu the government would obtain employment for such laborers on the plantations which have previously applied for the laborers. In this way the government is primarily responsible to the laborer and work is absolutely guaranteed to him before he leaves his home. The special advantages of the agreement made in Hongkong are that it is made with the Hawaiian Government, which guarantees labor on the terms and conditions set forth in the agreements, which gives the laborer $450 cash in U. S. gold coin for the three years in the one case, and $276 cash in U. S. gold coin for the two years in the other. On the completion of his agreement the laborer is free to accept any kind of agricultural employment or domestic service, but is debarred from employment in mechanical or mercantile pursuits.

The arrivals of Chinese contract laborers under this new form of agreement have been:

August 9, ex SS. Belgic	339
September 7, ex SS. Rio de Janeiro	202
October 7, ex SS. China	339
November 5, ex SS. Coptic	63
December 6, ex SS. City of Peking	144
Total	1087

Out of the 1087 only nine have deserted, six from Ewa, two from Honokaa, the other from Ookala. Though rewards have been offered for their arrest they are still at large. The law should be amended so has to provide

a severe penalty for those who harbor contract Chinese, as there is no doubt the six deserters from Ewa are still on this island among friends. The balance of the men have given much satisfaction on the plantations they were sent to. Every man was photographed before being shipped, and in accordance with the law, a set of special books have been opened and an account kept with each laborer of the amounts deposited by him each month. At the head of each account is a photo of the laborer, with the number of the conditional permit issued by the Foreign Office, also the number of the certificate of his identification, and the deposits as they come in are invested in the Postal savings bank each laborer having a separate book. Up to the end of the period 61 deposits were made with a total of $2610. Pass books with the certificate of identification pasted on the first page, and also containing a photo, have been issued from this office for every man. These are kept on the plantations and the amount of the deposit entered every month. The total amount of the deposits from Chinese laborers to be placed in the Postal savings bank for the month of January, 1896, will be $1912.50.

JAPANESE IMMIGRATION.

The arrival of Japanese contract laborers during the period have been :

	Men.	*Women.*
February 3, for Nanu Shosha Co.....	446	92
March 14, for Ogura & Co	503	108
May 5, for Japan Emigration Co.....	253	52
December 20, for Japan Emigration Co.....	649	100
Total.....	1,851	352

at this meeting decided that in future, whatever number of Japanese agricultural laborers the planters might require during the next two years, they must accept from the Government a number of Portuguese laborers equal to twenty per cent. of the total number of Japanese laborers imported. From that time on all applications for Japanese were accompanied by this agreement.

There have been one or two instances during the year of Japanese laborers causing trouble on plantations. An inspector was at once sent to the place to enquire into the trouble, and the result was an amicable settlement. In some cases the men were in the wrong, the trouble arising from a misunderstanding. On account of the rapid decrease of the Japanese Inspectors' and Doctors' fund with Bishop & Company, and the view of curtailing the expenses to be disbursed out of it as much as possible, the services of eight inspectors and doctors were dispensed with at the end of February, 1895. Two inspectors were retained, K. Okkots and N. Igarashi. Since then Okkots has resigned and returned to Japan.

G. O. Nacayama resigned as Inspector-General of Japanese immigrants June 6th, and his place filled by the appointment of N. Igarashi. The position of physician to contract laborers is held by Dr. Iga Mori.

TOTAL NUMBER OF LABORERS.

Attached to this report will be found a table giving the number and nationality of all laborers on Hawaiian sugar plantations December 31st, 1895.

WRAY TAYLOR,
Secretary Bureau of Immigration.

REPORT

OF THE

BUREAU OF FORESTRY AND AGRICULTURE.

HONOLULU, December 31, 1895.

J. A. KING, MINISTER OF THE INTERIOR AND PRESIDENT OF THE BUREAU OF AGRICULTURE AND FORESTRY:

SIR:—I have the honor of presenting the following report of the operations of the Bureau of Agriculture and Forestry for the year ending December, 1895:

GOVERNMENT NURSERY.

The work of distributing trees and plants from the Government nursery has been continued with Mr. H. J. Rhodes as gardener, assisted by three Japanese laborers.

Mr. Rhodes submits the following report of the work done during the past twelve months:

HONOLULU, December 31, 1895.

TO JOSEPH MARSDEN, ESQ., COMMISSIONER OF AGRICULTURE AND FORESTRY:

SIR:—I herewith submit the report of the Government Nursery, King street, for the year ending December

31, 1895, which I hope you will find entirely satisfactory:

Number of trees and plants distributed 14,709
Fiber plants 10,000
Number of persons receiving plants 400

Number and varieties of trees and plants now on hand.

FRUITS.

Papaia (carica papaya)	500
Avocada pear (Persia gratissima)	1,800
Mango (mangifera Indica)	1,000
Sour sop (anona muricata)	200
Custard apple (anona reticulata).....	150
Star apple (chrysophyllum cainito)	50
Rose apple (Eugenia Malaccensis)	200
Tahiti Vi	800
Tamarind (tamarindus Indica)	500
Lemon (citrus limonium)	150
Chinese orange.....	100
Limes	1,500
Mah vah trees (Bassia latifolia)	1,200
Liberian coffee.....	200
Orange seedlings	300
Jack fruit (artocarpus integrifolia)	200
Granadilla vines (passiflora alata)	200
Mamma apple (Mammea Americana)	100
Java cherry (Eugenia, species)	100
Strawberry guava	100
White guava	100
Sapodilla (zapote pear)	100
	9,550

SHADE, ORNAMENTAL AND TIMBER TREES.

Eucalyptus, 12 varieties	2,000
Grevillia robusta	2,000
Ficus aurea	200
Eucalyptus citriodora	250
Casuarina, in variety	500
Monterey cypress	250
Cassia, species	500
Logwood (haematoxylon campechianum)	200
Araucaria Bidwilli	250
Cryptomeria Japonica	500
Ceylon tea	1,000
Shade tree from India, no name	500
Camphor trees (cinnamomum camphora).	100
Calabash tree	100
	8,350

PALMS.

Latania borbonica	1,000
Livistonia rotundifolia	2,000
Ptychosperma Alexandra	2,500
Seafortha elegans	1,500
Pritchardia Martii (native palm)	2,000
Pritchardia Gaudichaudii (native palm)	2,000
Oreodoxa Regia (royal palm)	800
Thrinax Argentia	500
Sabal Blackburnia	500
Areca rubra	1,000
Brahea filamentosa	1,500
Areca alba	500
Areca catechu (butter nut palm)	200

Elaeis guinensis (oil palm)	100
Caryota urens (wine palm)	500
Arenga sacharifera (sugar palm)	100
Pandanus odoratissima	1,000
	17,700
Large specimens of various trees and palms in tubs and pots	500

These are kept on hand for loaning to festivals, celebrations, etc.

SENT TO MAKIKI FOREST STATION.

Orange seedlings	3,500
Sisal plants	500
Camphor trees	400
Cacoa and other trees	175
	4,575

In regard to the experiments I can say that the eight varieties of sugar cane have done splendidly and have yielded a considerable amount of seed.

The canaigre was planted on two square rods of land. Only about two-thirds of the roots grew, and the yield of clean roots was 255 pounds.

Upland rice planted June 25th, 1895, yielded 10 pound of clean paddy from 150 square feet of land.

The maranta aurundinacea (the true arrowroot plant) has done well; 18 small roots were planted on 65 square feet of land and yielded 35 pounds of fine well developed roots, some of them being over two feet long.

The amomum cardomomum (the true cardamom plant) has not fruited but has stooled out well, so that a

considerable number of plants can be obtained by subdivision of the roots.

The ginger has done fairly well, but would have done better had the situation been more favorable.

The turmeric has done splendidly and will yield a large crop.

The bassia latifolia (the celebrated mahwah tree of India) from 34 pounds of seed has yielded about 1,200 good, stror lants and seems to be at home here.

The baracoa or red Jamaica banana imported from Florida, has made a fine growth and has thrown up a number of new plants. None of the older plants (14 in number) have been in the ground long enough to bear fruit.

The trial patch of sansevieria (bow string hemp) now two years old is looking finely, it stands some three and a half feet high and is thickening up fast.

The experiments in grafting and budding the avocado pear have been very satisfactory, the main point is to procure wood and buds at the proper stage.

The past year has been very satisfactory, and I hope the showing will be satisfactory to the heads of the Government.

Respectfully submitted,

H. J. RHODES,
Gardener, Government Nursery.

The continuation of the work of reforesting the lands around and below Mt. Tantalus has been carried on by Mr. David Haughs with the assistance of five Japanese laborers. Mr. Haughs submits the following report of the work done during the year ending December 31st, 1895.

MAKIKI FOREST, DEC. 31st, 1895.

To J. MARSDEN, ESQ., COMMISSIONER OF AGRICULTURE AND FORESTRY:

SIR:—The following is a report of the work done in Makiki Forest for the year ending December, 1895:

TREES PLANTED DURING THE PERIOD.

Acacia decurrens	5,150
" mollissima	5,610
" melonoxylon	4,650
Casuarina equistifolia	1,240
" glauca	936
Eucalyptus marginata	120
" rostrata	360
Schinus molle (pepper tree)	500
Grevillia robusta	1,260
Locust, red seeded	350
Camphor	800
Cryptomeria Japonica	3,100
Logwood	515
Phoenix dactylifera (date palm)	300
Mangoes, large trees transplanted	60
Avocado pears	120
Autocarpus integrifolia (Jack fruit)	100
Olives, polymorpha	26
" manzanillo	25
" nevadillo	50
Walnuts, grafted	45
" seedlings	100
Chestnuts, grafted	45

Chestnuts seedlings	150
Persimmons, seedlings	360
Orange, Chinese	500
" native	800
" grafted	50
Apple, Mauri	5
Nephelium litchi	37
Bamboos, Burmah	250
Grape vines, Waliasi	30
" Caslilli Rauiani	25
" Cornichon	25
" Rose of Peru	25
" Black Hamburg	25
" Chasseles, fontainbleu	25
Peaches, Florida	100
Prunes, Japan	24
Total	27,893

TREES IN BOXES AND POTS.

Acacia decurrens	700
" mollissima	800
" melonoxylon	2,300
Casuarina glauca	300
Cryptomeria Japonica	500
Monterey cypress	300
Walnuts, Juglans sieboldiana	500
Giant chestnuts	700
Catalpa	300
Macadamia ternifolia, nut tree	50
Mangoes, common	1,300

Liberian coffee	150
Palms, Washingtonia	200
	8,120

TREES IN SEED BEDS.

Acacia decurrens	1,500
" mollissima	800
" melonoxylon	3,000
Sandle wood	60
Walnuts	800
Tea, Minipuri	1,200
Mangoes	4,600
Salt Bush	30
	11,990
Oranges in Nursery rows	2,200

The trees under the head of "Trees planted during the period," have been planted in the following localities:

Acacias, eucalyptus, pepper trees, grevillias, casuarianas are planted on dry ridges, lower down the slopes are planted, cryptomeria Japonica, locust, logwood, mangoes, Jack fruit, avocado pear, Chinese orange, olives and others. The bottoms of the gulches are reserved for grafted oranges, peaches and other choice fruits.

The forest is in a healthy condition, in the lower part of the older forest, where so many trees died during the summer of 1894, scarcely any have died during the past summer, this is owing, no doubt, to the frequent rains we have had all through the past year.

The acacia decurrens or black wattle is one of the fastest growers we have got, and although planted on dry and exposed ridges trees from 12 to 15 months old can be found as many feet in height.

Orange trees although healthy are growing very slowly but I have no doubt they will do better along the sides of the Makiki stream.

The olives are looking well but growing slowly. The persimmons are making very little progress, the same can be said about the chestnuts and walnuts.

The Florida peaches planted about eleven months ago are doing well, some of them are in flower at present.

A good deal of time has been spent during the past year in rooting out lantana from lands to be planted, making new trails, repairing trails, hoeing and thinning out.

I have the honor to be,

Your obedient servant,

DAVID HAUGHS,
Forester.

The reforesting of the Makiki reservation is an important work and shows what can be done by a small force under skillful supervision. The propagating and planting out of 27,769 trees with other necessary work of making trails, clearing land and thinning out, is a good twelve months' work for a forester and five men.

It will be seen from the report of the forester, that in addition to the planting of timber trees, some attention has been paid to the planting of fruit trees. This has been done with a view of testing our soil and climate for the production of many desirable fruits. It is the

intention of your Commissioner to largely add to the list of fruits from time to time as opportunity offers.

The bottom of the Makiki valley has been selected as a suitable locality in which to test such fruits as require a rich soil and a protected situation, other varieties will be planted in such localities as are best suited to their requirements.

In order to carry out this work in a proper manner an addition to the Makiki force is needed, the planting of forest trees can be carried on at about the same rate of progress as in the past two years, with the same force of five men as forest trees can, after a certain time be left to take care of themselves. Fruit trees, on the contrary, require constant care and cultivation in order to obtain the best results, and without proper care, little or no data as to their suitability to this country can be obtained. An addition of three laborers to the Makiki force is earnestly recommended.

NEW PLANTS, TREES, ETC.

During the past year several new (to this country) commercial plants have been introduced and tried on a small scale at the Government Nursery.

Mountain rice—Oryza sativa. A few pounds of the seed of this important food plant was imported from Ceylon, and a small patch of land (150 square feet) was planted at the Government Nursery, the seed was planted on the 25th of June and cut on about the same date in December. The yield was ten pounds of clean paddy, at the rate of 2,900 pounds to the acre.

Hill paddy or upland rice can be successfully grown on comparatively dry lands, and although the yield is less

than from water rice, the land upon which it will grow is so much cheaper, and the expense of cultivating and harvesting is so much less, that it would seem as if the cultivation of this great staple can be made a paying industry in this country. The cultivation of swamp or water rice involves an immense amount of hand labor in planting and harvesting the crop, the cultivation of hill paddy can all be done by the use of modern agricultural machinery. American plows can prepare the land, American drills can plant the seed and American self-binders can harvest the crop. The uplands of these Islands could be profitably cultivated with this plant.

Maranta aurundinacea—Arrowroot. This plant is the true arrowroot of commerce and differs from other starch producing plants, by yielding a starch that does not ferment after being prepared and cooked for food, this property makes it valuable for food for infants and invalids.

A small parcel of the roots (18 in number) was imported from Florida and planted on 65 square feet of land at the nursery, the yield was 35 pounds of fine well developed roots, this is at the rate of 11½ tons of root to the acre. The roots are said to yield from 15 to 20 per cent. of their weight in prepared arrowroot, a fresh piece of ground will be planted with a portion of the roots and the remainder will be sent to different parts of the islands for trial in suitable localities.

Turmeric—Curcuma longa. A small quantity of the roots of this plant was imported from Ceylon and planted on a patch of ground at the nursery, the plant has thriven well and promises to give a large yield of the roots; the dried roots are quoted in the London market at from 18 to 20 shillings per 112 pounds.

Cardamoms—Elettaria cardamomum. Bulbs of this plant were obtained from Florida and planted at the nursery, the plants have grown well but have not yet fruited, they have stooled out well and quite a number can be obtained by division of the root clusters. These will be distributed for trial in other places.

BANANAS.

After many trials your Commissioner succeeded in obtaining fourteen good healthy plants of the baracoa or red banana of commerce. These are growing finely at the Government Nursery, although they have not had time to fruit they have sent up quite a number of suckers or young plants, some of which have been distributed to the banana growers. This banana is a larger and finer flavored fruit than the cavendishii or Chinese dwarf banana that is now grown and exported from this country. The baracoa also possesses the very desirable quality of ripening much more slowly than the Chinese banana. In the Eastern States the baracoa banana is displacing all other kinds. In a short time we shall know how the plant fruits in this country.

Bassia latifolia—Mahwah tree. Seeds of this remarkable tree was obtained from the Royal Botanic Gardens at Peradeniya Ceylon. The nurserymen in Ceylon state in their catalogues that seeds of the Bassia do not stand transit for long voyages, and plants only can be sent. As it is not advisable to procure any plants from Ceylon owing to the existance in that country of the dreaded leaf disease (hemileia vastatrix) it seemed as if we should have to give up the idea of introducing this splendid tree, but knowing from experience, that many seeds that

lose their vitality in a short time if packed without any preserving medium, can be kept for a long time if packed in dry powdered charcoal, it was decided to procure seeds of the bassia latifolia packed in this manner.

The authorities in charge of the Royal Garden in Ceylon were requested to forward to this Bureau a quantity of the seeds of the bassia latifolia packed in powdered charcoal. The directors of the gardens kindly responded by sending 34 pounds of the seeds packed as directed. Owing to the embargo on freights from the East, during the cholera epidemic the seeds were carried past this port to San Francisco and back again, when the seeds finally arrived they were at once planted, and from 34 pounds of seeds we have over 1200 healthy young trees which will soon be ready for distribution.

The flowers of the bassia latifolia or Mahwah tree are used as an article of food by the people of India. When dried the flowers taste like dried lychis and will keep good for a long time, a good sized tree will continue to shed its flowers for 15 days at the rate of 100 pounds per day which weight is reduced one-half by drying. A mound (80 pounds) of dried mahwah flowers will furnish a fortnight's food to a family of two parents and three children. The seeds yield an oil used for lamps, soaps and culinary purposes. The tree is said to thrive from sea level to five thousand feet elevation, and if it finds a congenial home in this country it will be a valuable addition to the flora of Hawaii.

Palmyra palm—Borassus flabelliformis. Seeds of this noble palm have also been received from the Royal Garden in Ceylon, the seeds have been carefully planted and are now germinating freely. Next to the cocoa nut

the palmyra palm is the most useful of all the palms, it is the bread tree of India and will flourish in the dryest and most arid regions growing to the greatest perfection on a barren sandy plain.

Canaigre—Rumex hymenosepalus. The cultivation of this important tanning plant is progressing slowly. As in the case with all new agricultural products much has to be learnt concerning the cultivation of canaigre, that can only be learnt by actual experiment, and the past year has taught us much concerning canaigre. Planting in proper season is an important factor in producing a crop of canaigre roots, it has been found in all cases where the planting was done before November that a good crop was the result, later plantings were less successful. In order to obtain the best results canaigre should be planted before the first of October.

The content of tannic acid in Hawaiian grown roots is very encouraging. In New Mexico the content of one year old roots is from 23 to 25 per cent. of tannic acid in the sliced and dried roots, the samples containing 8 per cent. of moisture.

From eight months' old roots grown at the Government Nursery the following analysis was obtained (in all cases analysis refers to dried roots):

Moisture at 100 C	10.93	per cent.
Total extractive matter	36.60	"
Tannin	23.52	"

One year old roots grown by Mr. John Ena at his place in Manoa Valley, gave the following analysis:

Moisture at 100 C	12.75	per cent.
Extractive matter	50.42	"
Tannin	32.54	"

Mr. A. B. Ingalls, the chemist of Oahu College, who made both of the above analysis, says of the last one: "These roots were plainly moist and I was not surprised at the rather high results for moisture at 100 C. Thinner slicing and longer exposure to direct sunlight in a dry air would probably lower the percentage of water to 9 per cent. or perhaps even as low as 8 per cent., and, therefore, raise relatively the percentage of tannin and enhance the value of the root proportionately."

The cut worm or poka attacks the plant and eats the leaves at times, and some persons have been discouraged and have discontinued the cultivation, but it has been found in several instances that despite the ravages of the cut worm and allowing the land to grow over with weeds the roots have grown, and under the circumstances a fair crop has resulted.

The greater part of the roots imported in 1894 and 1895 were received long after the proper time for planting, in every case where the roots were planted in October and November a good crop resulted, the later plantings did not have time during the remainder of the growing season to develop many roots, but in all cases where these later plantings were kept free from weeds, they commenced growing in October and promise to yield a good crop by next June or July.

Abundant evidence is at hand that canaigre is a first class tanning material and that it will find a ready market whenever it can be put upon the market in steady supply. The only supply heretofore has been the wild growth from New Mexico and Arizona, which has always found a ready sale. This wild growth is now

practically exhausted, all within paying hauling distance of the railroads having been gathered.

Fears have been expressed to the effect, that as canaigre seems to find so much favor from the tanning trade and meets with such a ready sale, that New Mexico and Arizona would soon produce such large quantities of the article that the market would be over supplied. This is most unlikely. The plant grows well in both Arizona and New Mexico but it cannot be commercially grown in those regions without irrigation, the rainfall is entirely inadequate, being only about five inches per annum. With this rainfall the wild growth produces about three tons of the roots, after three years' growth, to the acre, with irrigation or a sufficient rainfall from 15 to 20 tons of the roots can be grown on one acre in one season. Efforts are being made in Arizona and New Mexico to obtain irrigation by means of windmills pumping water from bored wells. This will in many cases be successful, but no one can imagine that by this plan any great amount of canaigre can be produced.

Mr. H. P Wood our Consul at San Diego has rendered valuable service in obtaining information concerning canaigre and many other products.

The thanks of this bureau are also due to Mr. Frank Hastings. Charge D' Affaires at Washington for many valuable publications on tropical agriculture. Mr. Hastings is ever on the alert for anything that is likely to be of interest and value to this country.

BLIGHTS AND INSECT PESTS.

During the past year there has been a marked decrease in the scale pests that have for many years been very injurious to the flora of this country. The coffee blight

is now a thing of the past, the same can be said of several other scales that threatened the entire destruction of the citrus trees all over the islands. During a recent visit to Hawaii the writer was much gratified to notice the clean, healthy appearance of the wild guavas. In the recollection of the writer extending over a period of twenty years, the wild guavas in Hilo and Hamakua were always covered with a black fungus and badly infested with scales, these have now been eradicated by the beneficial insects introduced into the country. It is certain that those scales are subdued as the enemy is well established. The most cheering accounts come from Kona concerning the disappearance of the pulvinaria scale which so seriously injured the coffee trees as to make the outlook for the coffee grower in that district gloomy indeed.

This good work is entirely due to the beneficial insects collected and sent to this country by Professor Koebele while on his journeys abroad. During his absence he has visited Australia, China, Ceylon and Japan, and in each of those countries he has found and sent to this country many thousands of very valuable insects. Some of them have worked wonders in eradicating the worst of our scale pests. Professor Koebele has done all that can be done in the countries he has visited, and will soon return to this country and make a careful examination of such scales and insect pests for which no enemy has yet been discovered. Professor Koebele's work has been of the greatest value to this country, but it is by no means finished, much remains to be done, all the pests are not yet eradicated. The Japanese beetle is still as numerous as ever, and so far no effective enemy

has been found. The red spider (tetranychus telarius) is causing some concern to the coffee growers of Olaa. and so far no enemy has been found that will attack it. The cut worm or poka also at times does great damage to the young coffee trees. The cut worm also attacks the canaigre plant, and so far this seems to be the only drawback to the establishment of that promising industry. It is probable that enemies of these pests can be found, but to find them long and patient search in foreign countries will have to be made, and the work can only be done by a skilled entomologist, one who has made scale and insect pests and their enemies a life study, and no one is better qualified to carry on this very necessary work than Professor Koebele.

The climate of this country is particularly favorable to the propagation and spread of any scale or insect pest that may (in spite of the utmost vigilance) be introduced, and the only way to successfully combat such pests is to introduce the natural enemies that prey upon them. The services of Professor Koebele should by all means be retained for this country, for if not now secured the opportunity may be lost. The success of the lady birds in clearing off the coffee blight and several other blights that affected our citrus trees, has become known in other tropical countries, and this bureau is in receipt of many letters from coffee growing countries, inquiring as to the best means to pursue to introduce the natural enemies of the scale pests that injure their coffee trees. And without doubt, if Professor Koebele's services are not now secured, some other country will offer him an engagement.

CONSERVATION OF FORESTS.

The destruction of forests in this country is a serious matter. Large areas of land have within recent years become deforested, and the effect of the climate in those regions is shown by the decreased rainfall. Ninety-nine per cent. of this destruction has and is being caused by cattle. It is most unfortunate that so large an amount of the public domain has been leased for grazing purposes, nearly all the forest lands are now under lease to cattle raisers, and unless something is soon done to preserve the limited amount of remaining forests they will, in a short time be all destroyed.

The first thing that should be done is to extinguish the leases of all Government lands upon which the forest remains, and the Legislature is earnestly entreated to pass the necessary Legislation to allow this to be done.

Tracts of land in the agricultural districts that are suitable for the growing of a forest should be set apart for that purpose; and the agricultural interests will be found willing to assume the cost of fencing and the reforesting of the land.

This is a vital question and should receive immediate attention.

DISTRIBUTION OF SEEDS.

During the past year seeds of trees, forage plants and grasses have been distributed to plantations and others engaged in agriculture. The varieties of tree seeds have been such as our experience has shown to be adapted to this country, and it is encouraging to note

the increasing interest that is taken in tree planting by the sugar planters. This was plainly seen by your Commissioner during a recent visit to the Hamakua and Kohala districts. Belts and clumps of trees have been planted on many waste pieces of land, and the good work is being pushed with vigor. In Kohala the ironwood or casuarina equistifolia is the favorite tree, and many thousands of them have been planted. This tree stands the heavy winds that blow in Kohala better than any other tree that has been tried, it grows perfectly straight, while the blue gum (formerly considered the best tree for a wind break) is bent over by the wind and grows in a slanting position. In Hamakua the grevillia robusta is a great favorite and grows splendidly in that district. For quickly covering land with trees in situations that are not subject to continuous heavy winds, there is probably no better or quicker growing trees than the acacia decurrens or black wattle and the acacia dealbata or silver wattle. They multiply rapidly by the surface roots sending up shoots which grow very quickly. These trees should be planted on our deforested lands for first shelter. They will quickly form protection for other and more important trees.

FIBER PLANTS.

The cultivation of fiber plants is progressing slowly, a small plantation of the agave sisalana is being set out on Kauai and several nursery patches of the plant are being cultivated, the number of plants in the country is continually increasing and in a few years a large number will be available for setting out plantations on a commercial scale.

The cultivation of sansevieria or bowstring hemp is not making much headway, the climate of Hilo and Olaa, where it has been tried, has been found to be too wet for the plant, it grows fairly well but the heavy and continuous rains rots the inside leaves. In Hamakua the growth is exceedingly slow and little is being grown. A small patch of the plant is growing at the Government Nursery and is doing well, the leaves will be in condition to clean some time during the present year.

EXPERIMENTAL STATION.

Since the formation of the Bureau of Agriculture and Forestry (nearly three years since) it has been the endeavor of your Commissioner to introduce and establish new agricultural industries that would occupy the uncultivated lands, of which there is such a large extent on all the Islands of the group. In pursuance of this plan your Commissioner has introduced several new (and in this country untried) commercial plants. The business houses of Honolulu have always most generously responded to the solicitations of your Commissioner to allow him to import for them at their expense, the seeds and roots of such commercial plants as your Commissioner recommended as worthy of trial in this country. This is very well as far as it goes, but it has been found, that in the majority of cases, the plantation managers, to whom the things are sent for trial, have little time or inclination to devote to experiments with new things. In these times of low sugar prices the energies of the managers are devoted to the economical production of that staple and any new culture receives but little attention from them. On the other hand most of

our homesteaders and small landowners have not the means or the inclination to experiment with new plants. In some cases people are willing to make a trial of something new if the seeds and plants are given to them free of cost, and this has been done as far as the means at the disposal of this bureau will allow. The results from experiments of this nature are meagre and unsatisfactory, and little or no data of value can be obtained. Increase in the number of our agricultural industries will be slow unless the Government does the work of experimenting with all plants that may offer a prospect of adding to the limited number of our industries. Coffee growing is making rapid progress and for the present all goes well. The coffee grower at present finds no difficulty in procuring the necessary labor for clearing the land, planting the trees and keeping them cultivated, but in a few years from now when a large and increasing acreage of coffee will annually come into bearing, the procuring of the labor for picking the crop will be a difficult matter. Were coffee growing like sugar growing, the problem would be easy to solve. While the sugar grower can employ all his force of labor every working day in the year, the coffee grower needs only a few laborers for nine months and a large force for three months. Where to get this large force o pickers is the problem that will confront our coffee growers at no very distant date. It is estimated that in picking time one person is needed for each acre of coffee trees, while during the ramainder of the year one person can take care of several acres.

Experience in the past has demonstrated that any shortage in the labor supply causes the price of labor to

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